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NEWSPAPER

(CW Photos by M. Upton)

DP Up North

Members of the Chinese delegation from Peking attending the Canadian Computer Show in Montreal admire a photograph of one of them produced by Leigh Instrument Ltd.'s 1150 CRT hard-copy unit. Meanwhile, John Hamilton at the Dataline booth enters his chess moves on a terminal hooked to a PDP-10 in Toronto. The opponent, John Dion of Bell Canada, is on his own. An estimated 10,000 persons attended the show. (Story on Page 4)

Data Transfer Buffered

Microprogram Controller Ties 3330 to 30s, 40s, 50s

By E. Drake Lundell Jr.
Of the CW Staff

STAMFORD, Conn. – A new buffered controller makes it possible to attach IBM 3330 and 3330-compatible disk drives to IBM 360/30, 40 and 50 computer systems.

The buffered unit "absorbs" the difference in the transfer rates of the high-speed 3330-like devices and the slower transfer rates on the selector channels of the 30, 40 and 50.

Unbuffered Version

The new unit, manufactured by International Peripherals and Computer Corp. (IPC), and marketed by Computer Investors Group (CIG) here, also comes in an unbuffered version to connect 3330-compatible drives with the higher end of the 360 line (65s and up) and the 370 line.

IBM offers the 3330 drive only for 360/65s and above and several independent disk manufacturers offer the system for use with the 360/65 and up.

While the new system offers 360/30, 40 and 50 users somewhat reduced transfer rates than those possible with the larger end of the 360 line, it has all of the other features availahle on the 3330.

The problem with using a 3330 with the lower-end of the 360 line has been that the transfer rate of the 3330 (806 kbyte/sec) was far greater than any 360 below the Model 65 could handle.

The Sigtrol controller overcomes this problem with the addition of a 32,000 byte MOS buffer memory.

Data coming from or going to the 3330 can be read into or out of the buffer at the full 806 kbyte/sec transfer rate and the Sigtrol microprogram regulates the transfer rate to the maximum speed of the selector channel on the particular CPU.

Data is read out of or into the buffer at the maximum system transfer rate of 800 kbyte/sec on the Model 50; 480 kbyte/sec on the Model 40; and 333 kbyte/sec on the Model 30.

The buffer is divided into several sections capable of holding a full track of 3330 data. It is under the control of a Buffer Management Subroutine in the microprogramming.

The subroutine allows one section of

(Continued on Page 2)

Univac Disk Subsystem Outstrips 3330 Capacity

PHILADELPHIA – A disk storage subsystem with the largest capacity in the computer industry was announced last week by Univac.

The new Univac 8460 is designed for users who need large capacity, on-line information files.

Up to 2.2 billion characters of storage can be on-line and available in an average access time of 55 msec at an average transfer rate of 3 million bit/sec.

Access Time Faster

In contrast, the IBM 3330 offers a maximum of eight drives with a capacity of 100 Mbyte/drive. Average access time is considerably faster at 30 msec, but this is offset by the Univac unit's dual access arrangement option.

Designed for users of Univac 418 III, 494, and 1100 Series computers, the 8460 contains two independently addressable positioner modules, each of which can access 45,472K 36-bit words for a total storage capacity of 90,944K 36-bit words.

Each positioner module services 11 disk platters of which 10 are used for data storage. Each of 40 read/write heads can access data from one of two zones of 406 tracks each.

An 8460 subsystem consists of from one to four disk files and one control unit. All of the necessary logic and storage facilities for data and control are contained in the control unit.

Dual Access Configuration

The dual access configuration provides two control units and a set of independent lines to each positioner module within the subsystem for simultaneous read/read, read/write, write/read and write/write operation on any two positioner modules.

First deliveries are scheduled for October.

The control unit is priced at $1.050/mo and the 8460 disk unit at $3,950/mo on a one-year rental. Purchase prices are $37,350 for the control unit and $147,325 for the 8460 Disk File. The dual access feature costs $13,695 and rents for $370/mo.

N.H. Study Asks

Newer Cars More Risky?

By a CW Staff Writer

CONCORD, N.H. – Your brand-new car might be a fine status symbol, but it may be more dangerous than the four-year-old model you traded in to get it, according to a computer-aided study made here.

The study, made by the New Hampshire Motor Vehicle Division and based on 1971 accident reports, indicates that new model cars accounted for more accidents on the state's highways than did any other model year.

The 1971 model cars accounted for 6,366 accidents, which killed 41 people and injured 1,588. At the same time, 1968 model cars were involved in only 1,927 accidents resulting in only nine fatalities.

No Model Breakdown

Sources at the division said that the study does not indicate how many cars of each year were on the road, but they said there are not many more new cars than older cars, according to annual sales statistics.

Officials at the National Safety Council said they had never done a study comparing the relative safety of cars by their model year, but they indicated they were interested in reports of this type.

The New Hampshire study shows that 1970 cars followed the 1971 models closely in number of accidents with a total of 4,361 and 33 fatalities.

Then, the study reports, there is a sharp drop with 1969 cars, which accounted for 2,734 accidents and 19 fatalities, and then the further drop for the 1968 models.

Even the 1967 model cars have a better accident record than the newer models, according to the study, with these models accounting for 2,581 accidnets and 12 fatalities.

However, past that point the cars seem to "wear out" and the rate of accidents

(Continued on Page 2)

Medical File Data Bank Investigated

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Senate probers are investigating the operations of the Medical Information Bureau (M1B) said to maintain a computer-based data bank of health information on at least 11 million U.S. citizens.

People covered in the dossiers of the M1B have no legal recourse if the medical data is misleading or faulty, since medical records are specifically exempt from the provisions of the Fair Credit Act, which requires credit-reporting agencies to disclose contents of their files to the persons affected, Senate sources said.

The information in the M1B data bank is used by about 700 life insurance companies to help them "flag" bad risks for life insurance coverage, according to testimony at hearings before the Senate Subcommittee on Antitrust and Monopoly.

The files maintained by the M1B in an $8 million computer system not only contain information on physicians' examinations, hospital records and supposedly "confidential" government files, but also credit information obtained from commercial credit-reporting agencies, subcommittee sources indicated.

When contacted last week by *Computer-*

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Hearings Probe Health Data Bank for Insurers

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world at MIB headquarters in Greenwich, Conn., staff members said MIB officials were "unavailable" for comment.

How It Works

Most of the information in the files comes from previous insurance reports, sources said.

It seems, subcommittee staffers said, that when a patient files a claim under a medical insurance policy, he releases the information for the use of his insurance company. That insurance company can enter the information in the MIB files for subsequent use by other insurance firms.

So while the patient might believe that confidential doctor-patient information is only going to his own insurance agency, it is, in reality, made available to other companies in the field.

But while most of the information comes from medical insurance forms filed by doctor and hospital patients, some "confidential" government information also ends up in the files, subcommittee sources revealed.

Often one insurance company will receive information on a customer on a confidential basis from government agencies such as the Department of Defense or the Veterans Administration, they said.

Instead of entering all of the confidential information into the system, and therefore violating the confidentiality requirements, the firm will often just enter the fact that a person has a medical problem and that further information is available from the government agency.

Information Available

This data base of information on the health history of specific individuals is then available to all subscribers to the system.

In order to get the information from the data bank, an insurance company would file a written report with the MIB after it had received a request for life insurance coverage from the individual.

The MIB would then give the company information on the person's past ailments, credit status and other information that might make him a bad insurance risk. At the same time, however, the MIB report could also give the person a clean bill of health as far as the MIB files were concerned.

Senate sources, in noting that health information is specifically excluded from the Fair Credit Act, said the MIB in some cases will share the information on a specific patient with his family doctor if the doctor requests such information.

Individual's Rights

If a person is rejected for life insurance, they noted, he could request to see the credit information that the MIB gave to the insurance company under the Fair Credit Act and request it be changed if erroneous.

But if the credit rating is not the cause for the rejection of insurance, the person would have to ask his doctor to request the medical information contained in his file.

If that information proved wrong or misleading the person would have no legal recourse, however. He could ask the MIB to update the file or place a correction in it, but the MIB would be under no legal obligation to do so, the subcommittee sources said.

Other sources said the MIB files could also affect a person's chances of obtaining medical insurance, because most of the medical insurance in force is written by life insurance companies with access to the files.

The company that receives a report from the MIB is then supposed to carry out its own investigation of the person, congressional sources added, to see whether the information in the file is indeed correct.

"But we don't fully believe that they always carry out this independent investigation. In fact, we think that they usually just accept the recommendation of the MIB whout further checking," they added.

Book Control Is Budget Control

ST. LOUIS – A computerized textbook control system is saving St. Louis taxpayers money while insuring that students will have the right book at the right time.

A pioneering textbook inventory control program links the board of education warehouse and the data processing division into a single system.

Ernest Jones, acting superintendent, described the system as a time-, money- and labor-saving means of insuring optimum utilization of the $4.5 million worth of books the school systems owns.

"This is just one example of how computerization is making the school system more efficient and, therefore, of greater service to the community," he said.

The board runs a large-scale program with books located in 160 schools citywide and with an annual $800,000 expenditure for new and replacement books.

The IBM 370/145 has been given a complete, verified inventory of all 1,900 different books currently used in the school system.

When a principal sees a book shortage occurring or about to occur, he contacts the purchasing division. A clerk types in the catalog number of the book, and the district number from which the request came.

The computer then searches its files and compares, school by school, room enrollment against number of books issued. This is listed for the clerk who makes the transfer decision, entering the decisions into the computer.

In addition to handling requests from principals, the computer notifies purchasing officers of warehouse shortages that are about to occur, thus giving them time to obtain spare copies from other principals or replenish stocks from publishers.

Army Data Banks Still Exist: Ervin

WASHINGTON, D.C. – Sen. Samuel J. Ervin (D-N.C.) has reiterated his charges that information contained in Army data banks on civilian dissent has not been destroyed, even though the Defense Department ordered such information deleted.

The information from the files has not been destroyed, Ervin indicated in a UPI interview, because the data in the files has been given by the Army to many other federal, state and local agencies.

Ervin spoke out because neither the Department of Defense or the Nixon Administration has taken any action to track down the information given to other agencies, sources at Ervin's Subcommittee on Constitutional Rights said.

3330s Tied to 360 30s, 40s, 50s

(Continued from Page 1)

the buffer to accept data from the 3330 at the same time another section of the buffer is transfering data to the CPU.

"Despite the somewhat reduced transfer speed, the system is still faster than the 2314 through file access speed and different access techniques," according to Roger Goetz, vice-president at CIG.

The track access time on the 3330 is half that of the 2314, he said, noting that access time on the 3330 is 30 msec as opposed to the 60 msec access time on the 2314.

"But more important," he added, "are the access techniques."

The Sigtrol controller's microprogram speeds access times through rotational position sensing, multiple requesting and command chaining, just as the IBM 3330 controller does with 370 systems, he stated.

On the 2314, he explained, when access to a file is requested, the controller locks on to that file until it gets the data and transfers it into the CPU.

With multiple seek commands on the 3330, several files can be accessed and the controller microprogram tells the system when it is ready to transfer the data.

In addition to the speed advantages with the 3330 devices, the 3330 devices offer the user more than three times the storage capacity of the 2314.

A full 3330 subsystem (eight spindles in operation and one spare) has a capacity of 800 million bytes, while a 2314 eight-spindle subsystem contains only 233 million bytes.

The capacity of the 3330 system is also almost twice that of the double-density disk files (466 million bytes) offered by several of the independents.

A complete 3330-compatible disk system (controller and nine drives) for 360/65s and up (which require no buffering) will cost the user around $6,000/mo, Goetz said, compared with the $7,600/mo price tag from IBM.

Buffer Expense

The addition of the buffer requires extra expense, however, and the complete units (controller plus nine spindles) for 360/30s, 40s and 50s will be priced at approximately $6,800/mo, still 10% below the IBM price, he said.

Any of the independently manufactured 3330-like devices can be used with the system, Goetz said, and CIG is actively negotiating with several of the independents to use their drives in the system.

A user with IBM 3330s installed could use the controller to attach them to any models in the 360 or 370 line, above the Model 25, he added.

First shipments of the system for 360/65s and up will be made early this fall, probably October, with shipments for the lower end of the 360 line beginning later this year, probably December.

Study Says New Cars May Be More Risky

(Continued from Page 1)

increases as parts fail.

The 1966 automobiles were involved in 3,724 collisions and 1965 models in 4,333 accidents. But while this rate is up from the low levels of 1967 and 1968, they still compare favorably with the accident rate of the new 1971 models, the study pointed out.

In all, division officials noted that brand new or one-year-old cars accounted for almost 25% of all of the accidents on New Hampshire roads in 1971, a figure they say is suspiciously high.

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Slip of the Keypuncher's Finger Means City to Lose $290,000 in Tax Revenues

By Edward J. Bride
Of the CW Staff

WOONSOCKET, R.I. – A keypunch error compounded by a lack of programming safeguards will cost this city almost $300,000 in tax revenues this year.

The error occurred several weeks ago when the city's tax evaluation was being computed. It caused a 1967 Ford to be valued at over $7 million – $7,000,950 to be exact – and therefore cause the tax rate to be based on a figure that was about $7 million too high.

As a result, tax revenues will be decreased by $290,000, reported A. Robert Mailloux, finance director. The city will not increase the tax rate, so department heads will have to "pull in the belt," Mailloux said.

The error resulted when operators were preparing a test run for the property tax rolls on the municipal card-fed Honeywell 110. A keypunch operator mistakenly punched a "P" in the first column of a seven-column field.

The first four columns should have been empty, indicating that the automobile was only worth $950.

The logic of the computer, Mailloux related, stripped the zone bit from the field during a multiplication operation. The letter was thereby translated into a "7," and the next three blanks were filled with zeroes by the computer.

$182 Million Correct

The result, then, was $7,000,950 instead of $950 for the automobile; the total tax assessment for the city was originally reported as $187 million, based on an 80% rate, instead of the correct $182 million, Mailloux confirmed.

Tax revenues will be proportionately reduced, he added.

There were five checkpoints at which the erroneous card should have been detected and destroyed, he continued. In fact, the error was detected, and a new card punched, but the old card was not removed from the deck, despite the fact that a supervisor reported that it had been removed and destroyed.

Mailloux said the program should have contained checks that would not have permitted so great an assessment on an automobile to be processed.

A preparatory run by account number (taxpayer number) and another preparatory run by automobile registration number both should have detected the duplicate card, he related.

There were, however, "no programming safeguards," he stated. "Given human frailties, the program was the ultimate chance" to detect and avoid the error, he added.

The error was discovered two weeks ago, when the tax bills were mailed and the owner of the Ford received a bill for $290,000. Officials would not identify the recipient.

The error marks the "largest financial error in the city's history," according to local sources. Other observers suggested the $290,000 sum represented the largest amount ever lost, without compensation or recovery, for a computer-related error.

The actual loss will be increased if the city has to borrow money between now and the end of the fiscal year.

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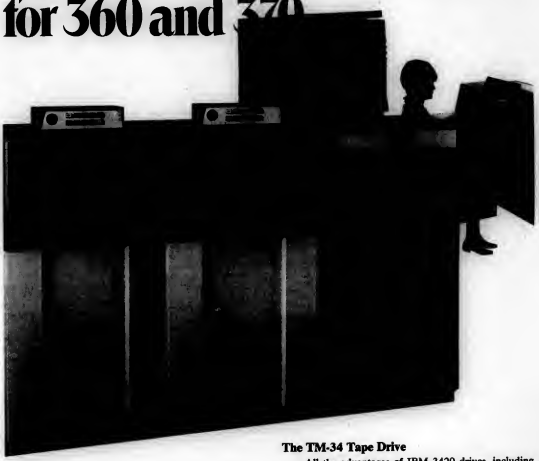

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Conference Speaker Wants Incentives

Canada Leadership Urged in Software Development

By E. Drake Lundell Jr.
Of the CW Staff

MONTREAL – A call to make Canada the leading country in the world in terms of software development was issued here last week by B.C. Scrivener, president of Bell Canada, during the keynote speech at the third Canadian Computer Conference.

An estimated 10,000 persons attended the Tuesday to Thursday exhibit held in conjunction with the Thursday to Saturday conference, with around 700 registered for the full technical program, sponsored by the Canadian Information Processing Society.

Two Firms Reappear

The exhibit floor was highlighted by terminal and communications equipment, plus a liberal sprinkling of minicomputer manufacturers. This latter category included several firms, particularly Digital Equipment Corp. and Hewlett-Packard, which were absent from the recent Spring Joint Computer Conference in Atlantic City.

In his address, Scrivener said Canadians must have "the opportunity to control each of the three basic elements of computer systems – hardware, transmission and software."

It is "unlikely," he added, "there will be a significant mainframe industry in Canada, but there is going to be extensive opportunity in the field of terminals and peripheral gear. In this latter category," he observed, "I include the minicomputer.

"The transmission aspects are firmly in Canadian hands," he added.

"It is in the software end of the business that the greatest opportunities and risks lie," he emphasized.

"In order for Canada to develop its own software competence certain steps are necessary," he noted.

First and foremost on the list of priorities, Scrivener stated, "software skills should have professional status like that afforded to engineering, legal and medical skills.

"If Canada would take the lead in this area," he said, it would be able to attract top quality people from outside the country to help develop a creative and viable software business.

'Every Incentive' Needed

In addition, Scrivener said that "every possible incentive" should be created to motivate firms to make the large investment necessary to create a viable software industry.

Canada spends a large amount, he noted, to shore up unprofitable industries in the country, and he asked "how much better would it be were we to make software investment the most attractive opportunity in Canada for our financial and human resources?"

In the development of software and systems, he said, hardware manufacturers have too often shown the "tunnel vision" approach.

But in the future, he added, the user will expect "a complete package of hardware and software maximization with the addition of privacy and protection features."

In the area of telecommunications, Scrivener said Canada offers more different computer communications services with better quality than any place else in the world, and at a better price.

"Both immediate and longer-range plans will see this lead extended," he predicted.

He felt there was a great future for computer communications systems in Canada, with digital transmission using coaxial and waveguide pipes finally moving out of the laboratory and into the marketplace.

Government regulation of this growing industry, however, he warned, could stifle its growth.

"There will be keen competition between entrepreneurs in this area," he predicted "and conflict between the entrepreneurs and government."

The marketplace should decide what kind of products and services it needs and wants, he added, and should not be hampered by unnecessary or incorrect government regulation.

Chinese Interested

There were few new significant products on the floor of the exhibit area for long-time show watchers, but a delegation of experts from Red China found plenty of unfamiliar devices and services.

In the area of new products, Leigh Instruments, Ltd. of Ottawa showed its Model 1150, a version of its Alphagraphic printer that can produce hard copies of television pictures, functioning as a CRT hard-copy printer, or as a buffered plotter.

As a CRT hard-copy unit, the device can buffer an image in one frame and print it out in 30 sec with an image resolution of up to 1,400 by 1,050 lines. It is compatible with any CRT writing format including raster, mini-raster, stroke, spot and spiral, the company said. Image size can vary from 5 in. by 7 in. to 10 in. by 14 in.

As a buffered plotter, the unit can fill its full-page buffer in 30 msec and print out in 30 sec. It uses digital input and is compatible with conventional I/O hardware and software, the company said.

The device uses paper of archival quality either 8-1/2 in. or 11 in. wide. The electrostatic non-impact unit eliminates the need for toners or ribbons.

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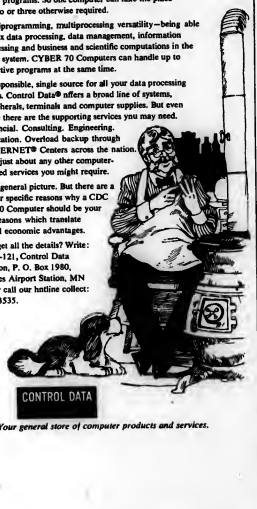

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High Schooler a Real 'Scrapper' With Those Machines

By Edward J. Bride
Of the CW Staff

CHICAGO – Arthur Okun is "obsessed" with getting his computer "running completely."

But Arthur Okun is different from any data processing manager . . . he's a high school sophomore working on a scrapped Control Data Corp. LGB-30.

The "primitive" computer, which young Okun likens to a "stripped-down 650, but with only 4K words," is still used for some civil engineering applications, such as bridge and street design, he noted.

Vacuum Tubes Needed

Okun has set a personal goal of making this machine perform meaningful functions, despite his lack of training and despite his need for about 100 vacuum tubes to refurbish the machine.

A student at Steimetz High School here, Okun considers himself about the equivalent of "a junior hardware engineer." He obtained the LGB-30 last October and reconditioned the drum.

The machine whirs and prints characters, but Okun has not reached the stage of practical applications because, like an old car, "when you fix one thing, another thing goes wrong."

(CW Photo by E.J. Bride)

Arthur Okun takes to the garage to tinker with his "primitive" equipment.

Okun's attitude toward his computer is much like that of a mountain climber. Asked why he spends so much time working on what appears to be an esoteric engineering machine, he replies, "I'm obsessed with getting it working completely."

Pending Invention

The next step, he says, is to use the drum as a mass storage device for "a computer I'm building." While his plans are uncertain regarding his pending invention, they were apparently spurred by donation of a 512-byte Fabritek core memory and by encouragement from computer experts in the area.

"They tell me I'm wasting my time trying to make the LGB-30 work, and that I should spend my time on my own computer." He hopes a medium-scale, integrated circuit computer with sophistication "somewhere between a PDP-8 and 11" will result.

Okun, aged "15-1/2, but you can say 15," says he learned about the workings of his machine through some CDC technical manuals that were written for engineers who had been through specialized training.

He demonstrated familiarity with the controls and operation, despite the fact the computer defies his efforts to be anything more than a valuable, technical learning tool.

He works on the machine in a garage/workshop at the rear of his house. Walking around the machine, he pointed out the photoelectric reader, the printer and other components.

Although the computer, he notes, is "not running perfectly, but partially," he is convinced he can complete his project, unless he is completely distracted by the desire to invent his new IC computer.

With more experience and about four more years of education, Okun thinks he may become a "senior hardware engineer." Since all his computer education so far has been in the garage, there's no telling what a college classroom could do.

Regional Exchanges Join Nyse Service

NEW YORK – Two regional exchange clearing corporations have become affiliate members of the New York Stock Exchange's (NYSE) Central Certificate Service (CCS).

The Central Certificate Service is a stock depository and computerized delivery system that eliminates physical movement of stock certificates.

The two regional exchanges, the Philadelphia-Baltimore-Washington Stock Exchange in Philadelphia and the Midwest Stock Exchange in Chicago, are the first regional exchanges to join the CCS depository, according to NYSE.

The CCS currently has more than 1.2 billion shares worth more than $40 billion in its depository representing some 2,900 issues traded on the New York, American and National stock exchanges and over the counter.

Under the agreement, the two regional exchange clearing corporations will each have an account in CCS and will be able to deliver stock and receive deliveries in eligible issues for their member firms by computerized bookkeeping entries. On the other side of these deliveries will be NYSE member firms and participating banks.

Participation by the two regional exchanges is expected to further reduce the securities industry's paperwork and mean substantial savings to users of bank draft, interest and other charges that result from physical deliveries of stock between New York and Chicago and Philadelphia.

Child Abuse Register Vetoed

ALBANY, N.Y. – A bill to establish a statewide computerized register for child abuse cases was defeated in the State Senate.

The bill was part of a five-bill package designed to curb child brutality. Sponsor of the bill, Sen. Roy Goodman, had hoped that the computerized system would help correct the current reporting system.

Opponents of the bill claimed the wording was too vague, and persons could be listed in the computer file, even if a false claim was made against them. But by the time Goodman tightened the language, the other four bills had passed and the legislature had adjourned.

Bomb Spares DP Center

MENLO PARK, Calif. – A bomb that went off outside a riot gun manufacturing plant here caused only structural damage to the outside wall of an empty office and did not affect the computer center inside.

MB Associates makes non-lethal stun guns for police.

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School Computer Bill Defeated, Lawmaker 'Ignorance' Blamed

PHOENIX – A bill that would have tied all the area's school districts together into a centralized computer system was killed recently because, in the words of its sponsor, several lawmakers felt the system would be used for "sensitivity training and pattern control."

Sen. David Kret (R-Scottsdale) said

News Wrapup

some legislators spread reports that personal data about pupils could be fed into computers and synthesized to control behavior. It was this "ignorance" which killed the measure, Kret said.

Kret's proposal would have attempted to more strongly coordinate school efforts in record-keeping and later in actual school instruction. The system, Kret added, would go a long way to consolidate what is now "spotty use of data processing" into a shared system.

Programmers Weren't Told So Newsmen Miss the Facts

PITTSBURGH – Because the Westmoreland County Data Processing Department wasn't told to program its computer to tabulate local election result totals by precinct, local newsmen were left empty-handed.

It seems that in the past computers were used to tabulate county-wide vote totals while newsmen figured their own breakdowns by precinct. But apparently this year newsmen were promised printouts of the results by precinct and were told not to tabulate their own results.

According to Lawrence Miller, director of the county DP department, no one mentioned this arrangement to his department. The department was not told beforehand to give the totals by precinct, he said.

At about 5 a.m., when the "lack of communication" became apparent to everyone, programmers tried a "new approach" to supply the needed data, but all the newsmen got was a general breakdown of the voting.

System Hopes to Spot School Vandalism Trends

SANTA CLARA, Calif. – What may be one of the first attempts in the country at tracking school vandalism with the aid of a computer is expected to be a fully operating system by this September.

Willie S. Ellison, supervisor of delinquency prevention services for the Santa Clara County, said his seven-man vandalism study committee has completed a "format," or checklist for reporting school vandalism and burglaries and hopes to have the system working in September. The list includes 127 items covering location, time of day, school lighting and alarm systems.

The committee hopes the computerized system will help spot trends and thus recommend methods of prevention and control of school vandalism.

According to Ellison, the new system will be plugged into the existing facilities of the Regional Education Center for Automated Processing, operated through the County Office of Education, for the five school districts.

DPMA Analyzes City's DP

SPRINGFIELD, Ill. – The Data Processing Management Association has completed a general survey of the city's data processing needs and recommended the top priority is to "prepare, or cause to be prepared, detailed specifications of the hardware and software for purposes of soliciting bids from vendors."

The free study was performed by the DPMA as a public service.

Another suggestion was that the "City Council provide for a centralized data processing facility."

Is Nothing Sacred Anymore?

OSHKOSH, Wis. – What's in a name? If your last name happens to be Uebersetzig, you've got too many letters, that's what – at least as far as the computer's concerned.

It seems Bernard Uebersetzig was cited for automobile nonregistration. He told the judge that after receiving a warning letter from the Department of Motor Vehicles prior to expiration of registration he waited, but received no word of the expiration date.

He notified the department which said his name was too long to be input through its computer, and a special notice would have to be sent. He waited again and this time the registration expired.

The judge dismissed the charge of auto nonregistration after the offender agreed to try and renew his registration.

FAA Studying New Pilot Advisory Aids

KNOXVILLE, Tenn. – The Federal Aviation Administration is currently evaluating the use of computer-generated voice messages to alert pilots operating under visual flight rules (VFR) to nearby traffic and terrain obstructions.

The VFR advisories will be produced automatically through a system of voice synthesis and broadcast over a specially reserved radio frequency to the Knoxville airport participating in the test.

The Knoxville test is part of an effort to determine the best systems approach to further reducing the potential for midair collisions in termina areas.

Computer-generated advisory messages could also relieve air traffic controllers of additional burden.

The VFR advisory service is currently a manual operation with controllers observing the traffic on radar and advising pilots by radio of other aircraft in their vicinity.

In the test, computers will analyze the traffic and provide automatic VFR advisories to all participating aircraft.

The automatic voice broadcasts will be closely monitored by controllers in the event the computer-generated messages are inaccurate.

The Automatic VFR Advisory Service Test System uses Univac 1230 and Goodyear Associative Processor computers, in addition to the Univac 1206 Span subsystem used to generate the synthetic "voice" for radio broadcast.

The voice consists of a 1206 computer to decode, format and buffer output messages, a drum memory on which the vocabulary is stored and a digital-to-analog converter.

FAA emphasized the test program is advisory in nature and does not mean that participating VFR pilots are under the control of the Knoxville tower.

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Regardless of the make (or size) of your computer, chances are excellent that you can find the peripheral equipment you need "on the shelf" at Control Data. Some recent additions to our line include a new cartridge disk drive which provides 25 million bits of random storage, a 200-line-per-minute line printer and a 300-card-per-minute card reader. Check our capabilities before selecting your next peripheral devices.

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Control Data offers a complete line of graphic, batch and interactive terminals. From large terminals with a full set of peripherals to small desk-top CRT display stations. Plus many in between. We also provide terminal operations control systems to make your data network operate more efficiently. Our terminal product line is designed to provide peak performance. Flexibility. And economy. Whether you have a CDC computer, or another make.

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Sometimes you may need expert data processing assistance. To initiate a project, put one back on track, or evaluate results of a project you have completed. Control Data can help at any stage. Our professional consultants bring in a comprehensive understanding of particular business and industrial problems. With their broad experience in systems analysis, they can develop cost/benefit reports to simplify management decisions. We can also design and develop new applications software for you. Or modify available software to meet your specific needs.

CPA-Like Certificate Needed: Professionals' Viewpoint

The call for some form of CPA-like certificate program to assist in increasing real professionalism within data processing – recently called for in the May 3 Taylor Report, and in the Professional Viewpoint page on May 24 – continues to evoke more reader comment. In general the comments are strongly in favor of the proposal, and it seems that a real possibility of some acceptable and useful certificate does exist. Excerpts from some of the letters follow. Your opinions will be welcome also.

Other Functions Possible

A major question remains to be answered. What function would be performed by a CDP? There are several possibilities.

- Certify generalized software.
- Audit application systems and certify accuracy, integrity, security, efficiency, etc.
- Audit organizations for management practices in the area of standards, resources and cost control, development of personnel skills, responsiveness to user needs, etc.
- Certify training programs and schools for data processing personnel.

The basic problem to professional recognition is the ability to act professionally.

The Professional Viewpoint Page is prepared by the editors of Computerworld, in conjunction with the Society of Certified Data Processors.

The prerequisite to professionalizing the data processor is to develop standards which are recognized and accepted by the management community. There is no single organization in existence that can posit such standards. Perhaps the Society of Certified Data Processors can develop into such an organization.

A.M. O'Reilly, vice-president, Brandon Applied Systems Inc., Arlington, Va.

Attitude Most Important

Although it may be true that certain basic standards may not change, DP technology changes at such a rapid pace that proof of knowledge of today's standards does not necessarily qualify a person for tomorrow's job.

A reasonable display of professional success as the industry evolves, however, is an indication of the individual's ability to remain current and thereby qualifies him as a candidate to lead tomorrow's job.

The ability to absorb and apply knowledge does not necessarily improve with the degree of formal education, but rather with the individual's personal desires combined with his professional experience.

Robert V. Buchwald, director, Washington Medical Data Center.

Getting to the Meat

The CPA is a specialist in a particular application – financial systems.

How is it now that we appear to assume that all one must do to certify the work of other EDP department "professionals" is to have thorough knowledge of the computer? It strikes me as saying that the butcher is an expert only with knife and cleaver – it's important that he knows such things, but it is hardly the extent of required knowledge.

Instead we have to determine what the real needs are, what are the things that suggest there is a need for certification at all, and just what it is to be certified.

R. Ware, Ware Associates, Hudson, Mass.

Remember Other Societies

The certificate could be of great help in maintaining professionalism.

The certificate signer must have some credentials himself, and initially these will have to be significant to lend weight to his signature. Once certification has become accepted, then the qualifications of the certifier will come down to a standard level.

While t agree with your logic that there is need for two societies within the data processing profession, I don't see the need to establish any more, without the concurrent demise of the existing societies who claim their membership is involved in data processing.

If we refuse to recognize the ACM, DPMA and IEEE, and their contributions, we will only alienate those whom we need to insure the development of the standards necessary to define the DP profession.

Gerard P. Shabe, commander, U.S. Navy, Command Management, Information Systems Officer.

Is 'Membership' Needed?

I know accountants who enforce AICPA standards and who modify their practices on the advice or directives of CPAs, but they are not necessarily members of accounting societies.

I think we do have to work on DP standards, on CDP selection criteria, and on gaining the support of the DP profession and legislative bodies for our ideas.

These standards could then be enforced operationally by DP practitioners – be they professionally oriented or not.

Mike Ingram, Northfield, N.J.

Survey on Prerequisites For CPA-like Certificates In the EDP Industry

1. Under what conditions should a CPA-like certificate be required?

- ☐ Running any computer installation
- ☐ Running some specific applications
- ☐ Holding confidential information
- ☐ Offering data processing software for sale
- ☐ Other _____

2. Under what conditions should an otherwise qualified person not sign a CPA-like certificate?

- ☐ When he is employed by an installation
- ☐ When he is employed by a hardware or software supplier to the installation
- ☐ Other _____

3. Before a certificate is given, what guides are needed?

- ☐ A general rule book of known unprofessional practices
- ☐ A general rule book of application requirements
- ☐ An in-house system specification
- ☐ Other _____

(Continue any answers on a separate page if necessary.)

Name _____

Address _____

_____

Professional Position _____

CDP? _____ CPA? _____ SCDP? _____

Please return to The SCDP, c/o The Professional Viewpoint Page, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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Control Data Institutes offer special education programs to sharpen the performance of your key people. Technical seminars. General management education. Programming courses. Systems analysis courses. Electronic data processing equipment maintenance courses. And many more. Education programs that have contributed to efficiency, productivity, and increased profits for companies throughout the world. We'd like to discuss and evaluate your training needs and make a recommendation on how to meet them. Or if you need reliable personnel to help man your computer facility let us know. Our wholly owned and affiliated Institutes here and abroad graduate thousands of professionally trained people every year. Our placement departments can probably help you fill any position you have open. No fee.

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Our CYBERNET® Data Centers, located in key cities throughout North America, Europe and Australia, are staffed and equipped to help you in a variety of ways. Our batch processing and time-sharing services help computer users handle overloads or extend system capabilities. Terminal users plug into the CYBERNET system with a wide variety of remote terminals designed for various input/output needs. (CYBERNET time charges are very attractive—particularly when you use our CYBERPAK® guaranteed usage plan.) There is even a Contract Data Services staff available with teams of experts who can assume complete operation of your computer center for you—freeing you from costly and time-consuming personnel training and administration chores.

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A new catalog of Control Data's OEM offerings is now available. Call us, or mail the coupon below, and we will rush you a copy. It tells much you will want to know about our broad line of OEM products, back-up services, etc. If you are interested, we can make arrangements to demonstrate our equipment for you through one of our many worldwide sales and service offices.

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Editorial

Support Needed

Rep. Jack Brooks is sponsoring a bill that would establish the National Academy of Sciences Computer Board as an advisory panel on computer-related issues and authorize the board to spend up to $3.5 million a year for studies.

The bill also would authorize the spending of up to $100 million under the direction of the National Bureau of Standards for civilian computer-related research.

These two sections of the bill need the support of everyone in the computer community. Overall studies of such social issues as privacy and such technical problems as interface standards are already long overdue.

We urge you to write to your local congressman, outlining the urgency of the situation, and to send a copy of the letter either to Rep. Jack Brooks or to the Government Activities Subcommittee, Committee on Government Operations, Room B-350-B, House Office Building, Washington, D.C. 20515.

Letters to the Editor

'Due Process' Should Govern DP Revocation of Rights

Articles in *Computerworld* about government data processing keep leading up to plans for automated cancellation of citizen's rights and privileges without a trace of "due process of law."

For example, Memphis announces its intention to deny auto inspection stickers until traffic tickets are settled, and West Virginia considers refusing drivers' licenses until county property taxes are paid. These are perfect examples of systems design carried to its "logical" totalitarian extreme, of citizens' rights abolished for governmental accounts-receivable convenience.

They are doubly offensive because they ignore the existing, considered, legislated routes of recourse: summonses for scofflaws, forced sale for delinquent taxes.

If the state ignores the laws, why should we obey them?

How would you like to be refused the ballot because the public library thinks you owe them an overdue fine? Serious current plans fall only slightly short of such scenarios. Realize further that a single miscoded data item or careless assumption could bring these "cruel and unusual" punishments down on the wrong person, leaving him guilty until . . . next monthly file update.

Robert Higgins, CDP
St. Davids, Pa.

Data Entry Savings Based on Labor Costs

Regarding David Reser's letter to the editor [CW, May 3], I explained to the *Computerworld* panel workshop participants that the figures I quoted on operator productivity for key-disk data entry were based on an eight-hour day with no allowances for personal time.

When "pure" time is clocked, i.e., the keystroke average just while the system clock is running, our average is between 18,000 and 20,000 KSPH, depending on the source document. But, I do not consider these figures realistic for labor cost purposes as we cannot keep a heavy foot on the throttle constantly, allow two 15 minute coffee breaks, plus the usual "rest room" time, and come up at the end of an eight-hour day with the averages I quoted.

At the present time our installation operates with two shifts employing 190 operators on 76 key stations, 45 buffer-type key-card machines and 22 basic-type key-card machines.

As for hardware costs, they are definitely higher than when all our equipment was basic key-card, and that is taking into consideration the elimination of cards and their attendant handling and storage costs. But, we have all the optional features on our key processing systems, such as auto-balance, check-digit and printer.

This allows us to eliminate some key verification. Also cleaner input is now going to the CPU, and savings are realized by the user departments who receive cleaner output in less time.

As I said, the savings have been on labor costs.

Mary A. Lanahan
Computer Operations Dept.
Data Recording Section
Pacific Gas and Electric Co.
San Francisco, Calif.

Spooling Package Lauded

The article "370 Circuits Heat Up User Problems" in your April 26 issue stated "leasing a one step up 360 system from a third party can provide the required throughput, and at a cost below that now paid IBM for monthly rental."

Another alternative is the addition of a spooling multiprogramming support package which can significantly impact throughput, as well as provide support for remote terminals.

This third-party software called Grasp, marketed and supported by Software Design, Inc., of Los Angeles, has enabled us to reduce a 20- to 24-hour-per-day workload to a 16-hour-per-day workload and at the same time add the workload from a remote terminal.

It provides additional multiprogramming facilities not available under DOS. It has expanded us sufficiently to make it unnecessary for us to even consider OS and at the same time has given us many of the support features of OS.

Charles W. Frank Jr.
Data Processing Manager
Dunham-Bush, Inc.
Harrisonburg, Va.

'Sleuth' a Meta-Assembler?

The fact that code produced by assembly-level languages is more efficient than that produced by higher-level languages should surprise no one [Assembler Level Languages Rated High for Efficiency, CW, May 24].

The only finding that surprised me was that "Sleuth programs . . . required slightly more storage than assembly programs." As the author of Sleuth for the Univac 1107/1008, I was under the impression that Sleuth was an assembly program (or meta-assembler).

Evidently, this falls under the rule of the great sleuth, Sherlock Holmes: "When you have eliminated the impossible, whatever remains, however improbable, must be the truth."

David E. Ferguson
President
Group/3
Los Angeles, Calif.

DP Stamp List Offered

I was interested to see M.W. Martin's article on computer-related stamps in your March 29 issue, and also Kuch's addition of the Dutch postal checking issue.

For sometime, I have been building a collection of such stamps and have, with the help of three correspondents, compiled a listing.

I am constantly updating this listing and would be happy to mail a copy to anyone who sends me a stamped, self-addressed envelope.

Robert V. Boos

66 Crescent St.
Hicksville, N.Y. 11801

Behold the Service Vendor!

Eberhard C. Stotco [CW, May 24] identified a problem which is all too common in small or medium corporations, as well as large corporations. Unfortunately, the subject company blamed centralization for their woes, rather than mismanagement, lack of proper cost controls and lack of flexibility.

Executives in an ever-increasing number of companies have found the solution by relying on a reputable outside service vendor who offers scale economy in communications and processing, the flexibility of variable cost computing, detailed job accounting for cost control and analysis based on results, and high standards for reliability, availability and security.

The network information service industry is maturing into what could well become a replacement for most in-house data processing.

A.P. Weeks
Market Manager
Data Processing
General Electric
Bethesda, Md.

Wraparound Rings Defended

We were quite surprised to read the rather subjective comments on wraparound rings for magnetic tape in your May 17 issue on page 25. We did not expect such comments, where objective facts prove differently, in your very excellent publication.

Wright Line's Tape-Seal product has been installed for over seven years in many of the leading tape libraries of the U.S. and currently protects more than 50% of the active tape in use today.

The notion that canisters are more protective than wraparounds is a psychological observation that is simply not true.

For example, wipe the inside of a canister that has been in use for more than a few months with a clean cloth and you'll find a fair saturation of dust.

The article stated that canisters prevent tape damage caused by reel flanges. Quite the opposite is true. The incidence of tape edge damage caused by deflection of reel flanges has been proven to be far less when wraparounds are used.

A one piece wraparound forces an operator to handle the reel by the hub, instead of the flanges. The interior grooves in a wraparound act as a spacer between reel flanges to prevent them from being pressed onto tape edges. These same grooves evenly spread pressure around the entire periphery of the reel flanges thereby inhibiting flange distortion or warping.

Wraparounds offer more than space and cost savings. The hidden key to their successful acceptance lies in the fact that they promote faster and safer tape handling.

E.W. Housh
President
Wright Line
Worcester, Mass.

The statements made in the article came from the March issue of the Army newsletter, *Information Processing Systems Exchange*, and were not intended to represent *Computerworld's* viewpoint. Ed.

Follow the Who?

In the May 17 issue, Alan Taylor describes a method used by Peripherals General to test packs for use with their "increased capacity" disk drive. Taylor also states: "It seems that Peripherals General's approach is an example other independents will find worth following."

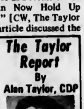
The ISS 715 (Telex $625 and Itel 3101) disk drive coupled with the control unit has had this type of feature available to customers since August 1971. ISS has expanded the IBM Disk Initialization program to analyze each cylinder on the disk pack using special defect detection circuitry in the drive. The special circuitry is enabled by a new controller command called on by the expanded initialization program.

Dick Grove
San Francisco, Calif.

When Is a Premium Not a Premium?

Who Is the Ideal EDP Auditor-a CPA, CDP or Both?

The Taylor Report
By
Alan Taylor, CDP



There have been many comments on the position of EDP auditors as a result of the column, "CDPers Can Now Hold Up EDP's Arch of Quality" [CW, The Taylor Report, May 3]. The article discussed the value to DPers of having some form of a CPA-like certificate. Most of the respondents felt there would be a great value in such a certificate, and that it did not need to have a set of supermen to give it.

What was needed, they said, was someone with experience in the DP field, who had passed some form of professional exam. Such a person would be able to give a valued certificate. (many of these letters were summarized in the May 24 Professional Viewpoint).

One interesting letter took a rather different tack, however. It came from Howard Friedman of Los Angeles. Friedman is a vice-president of the EDP Auditors Association. His basic question was, "Should the EDP Auditor be a CDPer and a CPA?" He also questioned whether or not controls should be the only concern of such a person.

Friedman commented that these matters were considerably discussed inside the association itself, thus emphasizing EDP auditors have not yet determined what their role really is.

Controls Don't Stop Complaints

From the viewpoint of the EDP professional, I think the question of whether or not controls should be an EDP auditor's only concern is answered by the widespread public distrust in the current EDP systems.

Many of these complaints would not be eliminated by even the tightest of controls. And yet, these complaints are the symptoms of the bad systems operations, and this is exactly what we have to eliminate before we can possibly deserve any CPA-like certificate of EDP adequacy!

If such certificates were available to many of these systems, they would become whitewashes – and would soon stop being respected.

Auditing a Premium Notice

Instead, an EDP auditor has many other concerns. For instance, consider an audit of the adequacy of an output form – say, for instance, the premium notice (Figure 1) issued by New York Life Insurance Co. to a Donald R. Connors of Shawnee Mission last month.

The premium notice is in fact a bill calling for the payment of $23.25 interest on a loan! It is not a premium notice at all – so no wonder CDPer Connors sent a copy of it along to me.

A CDP-qualified auditor might be expected to provide three initial examinations:

- A Static Examination, where the notice involved was examined without reference to computer programs, or to the way in which it was being used by the New York Life Insurance Co.
- A Usage Examination, where an examination is made as to how the notice is actually being used. This normally requires the examination of a sample of reasonable size. It results in an understanding as to how effectively the available options are being used in the real world.
- It can result in recommendations about the form itself, and also about the instructions given to the people who are originating the input.
- An "Exceptional-Item" Examination. This examination deals with an unknown volume of examination items – complaints, error reports and adjustments entered into the system. Clearly errors in the actual document, which are later found to need correction, may reflect items which need not have "erred" in the first place. The examination of the contents of the error paths then may give the auditor valuable information about the effectiveness of the form design.

All these are standard and valuable approaches to auditing an EDP system. In the case in point the static examination would notice there was no date of preparation shown. The usage examination would note that a premium notice form was being used to send out bills for loan interest.

The exception item examination would reveal that Donald Connors had sent in his change of address notice in February, independently from the operational people.

NEW YORK LIFE INSURANCE COMPANY • 51 MADISON AVE., NEW YORK, N.Y. 10010

CENTRAL SERVICE OFFICE BOX 1496 PHILADELPHIA PA 19105

POLICY NUMBER	INSURED	DUE DATE
30 376 273	DONALD R. CONNORS	MAY 28 1972

PREMIUM NOTICE PART 1

*THIS NOTICE AND STATEMENT WILL APPLY IF THE POLICY IS IN FULL FORCE ON THE RESPECTIVE DATES STATED.	LOAN INT	PAY THIS AMOUNT
	23.25	23.25

POLICY'S CASH VALUE (EXCLUDING DIVIDEND CREDITS) WILL INCREASE BY $165 IN POLICY YEAR ENDING MAY 28 1973. *

Figure 1. Donald R. Connors' insurance 'premium notice' from New York Life Insurance Co. calls for payment of interest on a loan.

and that it had not yet been implemented. This would have been found in his complaint about this to Frank Howard, the assistant vice-president of central services. (His complaint says that although he has had the policy for eight years, during which he had changed his address several times, he has yet to have a timely change of address made by the company!)

"Perhaps in the title of 'EDP auditor' we are putting together two distinct functions, simply because they share one common trait."

Points Hardly Reportable

The EDP auditor's problem arises because even having noted these facts, the EDP auditor has little real authority to draw them to management's attention. He can, of course, write a memo, but that is about all. His comments don't fit into a CPA's standard operations!

These items are noticeably different from the ones affecting the internal controls. Indeed, they suggest that perhaps in the title "EDP auditor" we are putting together two distinct functions, simply because they share one common trait.

Auditors working on controls, and auditors working on EDP-output problems will both be taking their position posed to a non-EDPer in order to be able to ensure the EDP system will not affect the validity of the financial and control systems.

By contrast, the EDP auditor who is concerned with the proper working of an EDP system and who is concerned with the dangers and possibilities implicit in such EDP systems is working at a different operation.

This function is not the financial audit – which has to continue with his operation – even though the auditor may also be the financial auditor. He may just as well be a programmer, or a systems analyst, or an operational management man. His function is to produce a certificate affirming the system is working from *an EDP point of view* – not from a financial one.

I think that this puts Friedman's questions into proper perspective. If an EDP auditor is to pass authoritative comment upon the financial controls, then I expect the EDP auditor will have to be a CPA. However, if he is to pass authoritative comment upon the many other vital EDP matters, then the fact that he has passed the CPA exmamination does not qualify him to make such comments anymore than if he had taken a degree in archeology! (Nor does it prevent him from making valuable comments.)

If, however, he wants to pass such comments authoritatively then it appears from the responses we received that he should have experience in EDP, and should have passed some professional examination, such as the CDP.

So perhaps the EDP Auditors Association should split into three sections – the CPA section, which concerns itself only with the controls area; the CDP section, which concerns itself only with details of the systems operation; and an intermediate area with people who have both the CPA and the CDP. (Providing that the association can find enough qualified members for such a section!)

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BLUE SHIELD

135 FEDERAL STREET, BOSTON, MASSACHUSETTS 02106

PATIENT A TAYLOR
CERT # 4894941
DOCTOR 3-01-72
DATE OF SERVICE
CLAIM # 0811764

TAYLOR ALAN E
633 CENTRAL ST
FRAMINGHAM MASS

FRAMINGHAM 0
$8.00
4-11-72
04 PLAN
FOR REVENUE 7

RECEIVED
AMT. PAID
DATE PAID
CHECK #

YOUR BLUE SHIELD CLAIM HAS BEEN APPROVED FOR THE AMOUNT SHOWN ABOVE. WE ARE GLAD WE COULD BE OF SERVICE.

BLUE SHIELD

135 FEDERAL STREET, BOSTON, MASSACHUSETTS 02106

PROCESSED DATE 04/11/72

PATIENT A TAYLOR
CERT # 4894941
DOCTOR FRAMINGHAM ORT
DATE OF SERVICE 03-01-72
PLAN 01 FOR REVENUE

TAYLOR ALAN E
633 CENTRAL ST
FRAMINGHAM MASS

YOUR RECENT REQUEST FOR BENEFITS FOR SERVICES RENDERED BY YOUR DOCTOR CANNOT BE APPROVED

THE REASON FOR NOT APPROVING THIS CLAIM IS INDICATED BELOW.

CLAIM 0811764

A COPY OF THIS NOTICE IS BEING SENT TO YOUR DOCTOR.
THE SERVICE RENDERED THIS PATIENT IS NOT COVERED UNDER THE BLUE SHIELD CONTRACT.

KEY TO TYPE OF PLAN

1. USUAL AND CUSTOMARY – BASIC
2. PLAN B
3. USUAL AND CUSTOMARY WITH P.J.C.
4. PLAN B WITH P.J.C.
5. MASTER MEDICAL (PLAN B)
6. FEDERAL HIGH OPTION
7. FEDERAL LOW OPTION
8. PLAN B (REVISED)
9. MASTER MEDICAL (USUAL AND CUSTOMARY)
10. PLAN B WITH SPECIAL BENEFITS
11. OTHER

KEY TO TYPE OF SERVICE CODE

1. MEDICAL SERVICE
2. SURGICAL SERVICE
3. OBSTETRICAL SERVICE
4. ASSISTANT SURGEON
5. SURGICAL AFTERCARE
6. ANESTHESIA
7. DIAGNOSTIC X RAY
8. ENDOSCOPIC SERVICE
9. X RAY THERAPY
10. DENTAL SURGERY
11. LABORATORY
12. CONSULTATION

Another Confusing Example

M.K. Garrison's comments about our constant subjection to poor data processing practices [CW, May 10] was underlined by the arrival of these two computerized outputs at my house. They both referenced the same claim (0811764), but one stated it has been approved – and one that it had been rejected. There certainly are not the same number of errors as on the second school report – but then there is not the equivelent amount of information to get confused in either. I would like to hear your opinion about what is wrong – and what, although not necessarily wrong, could be improved in this case. The fronts of the two forms are shown above, together with the reverse from the acceptance form.

CRASH

You can prevent Head Crash with System 316
SEND FOR COMPLETE DETAILS.
The TEXWIPE Company
Box 278-A
Hillsdale, New Jersey

ACM Group Told

Users Must Subdivide Security Area

By Don Leavitt
Of the CW Staff

ATLANTIC CITY – Almost all users are concerned about security, but that one word is too vague to be useful in solving the problems it suggests, according to James Hubbard of Univac.

Instead, the general area of security has to be subdivided into three areas that can be defined and, as a result, possibly solved. Users have to be separately concerned with the physical security of their files, the logical integrity of their data and the privacy of their files, Hubbard told an ACM Special Interest Group on Business Data Processing (ACM/SIGBDP).

He then spelled out how Univac attacked these problem areas within its own real-time system. A combination of strictly enforced clerical procedures and techniques built into the system has worked well in all three areas, he said.

The current files are protected against accidental destruction in part by the management decision that all application programs must be tested off-line, and then by providing facilities so this is done.

Access to the real data base is possible only through a subroutine of the real-time system, he said, explaining this meant files "dumped" by a utility program would be unreadable.

The Log Tape capability enables Univac to log all transactions that affect the files, for recovery, audit and accounting purposes. In addition, daily copying of all application programs, and the ability to restore them in total or by individual program, prevents or at least limits "disasters" in case of program bugs, he said.

File privacy is provided principally through a password approach. Each new user is given his own password and instructions to immediately change it so that only he will know what it is.

Unauthorized users can't even play guessing games to find a good password, he noted, because the system closes down a terminal if a user cites three invalid passwords in a row. It takes a manager's call to corporate DP to release the terminal.

Beyond that, Univac has a system of line and station control methods under which responses will only be given authorized terminals and certain transactions can only be entered through specific lines.

Michigan Schools Link Up

EAST LANSING, Mich. – Three of the state's largest universities have tied their computers together in a comprehensive program of interuniversity cooperation. The university network, which now includes Michigan State, Michigan and Wayne State, can be further expanded to enlarge computer resources of other educational institutions.

Coming in the June 28 issue of *Computerworld* is a special supplement on

Software and Measurement

In this supplement, our editors will examine the current state of the software field, including:

- Improving CPU productivity through efficiency measurement packages.
- Time sharing packages.
- DOS enhancement from independent suppliers.
- New software support to RCA's Spectra users.
- Improvements and new packages for small systems.
- Application and machine packages.

This supplement is must reading for computer users and must advertising for software marketers.

Closing is June 9. Contact your *Computerworld* representative soon, as ad space is limited. For details, call Dottie Travis or Dawn Silva at *Computerworld*: (617) 332-5606.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

De Shetler

Smith

Managers Differ On Key Issues In Last 3 Years

By Edward J. Bride
Of the CW Staff

MIAMI BEACH, Fla. – If four management-level computer users gave their opinion on the "key development" or issue raised over the past three years, it's likely that four different answers would result.

This theorem was proven when *Computerworld* asked that question of four members of the Association for Systems Management, during a recent conference.

Ronald K. Smith director of DP, Ohio State University/Research Foundation, answered: "We are end users of computer centers, and have seen them develop from a batch mode to on-line. We're still batch in our applications, but we are changing our thinking to on-line. There used to be a restrictive attitude, but now the centers can support us, no matter what we want to do.

CW Inquiring Photographer

"Technology has brought about a change in thinking. Users are more sophisticated now, and have the attitude of making the computer serve the end user, instead of controlling him. This is partly due to technology, of course."

Weaver

Trout

Fred M. De Shetler, manager of systems and data processing, Doehler-Jarvis Division of NL Industries, Toledo, Ohio, said: "I am getting more concerned with motivating and working with systems analysts. People are becoming more important than equipment. Managers are realizing that they have to motivate people, and they are concerned over how to do it best. For example, I just attended a session on job enrichment as it relates to personnel motivation."

William F. Weaver, senior systems analyst, United Farm Bureau Mutual, Indianapolis, Ind., felt "software control programs have become important to me. Cost control and resource monitoring applications have proven that it can be worthwhile to spend money for the sake of controlling money. Hardware advances have been significant, too, but it's more and better of the same thing, while in software there are new entities. We can now do things that we never would have even attempted manually in the past."

Jerry J. Trout, manager of systems and procedures, Fisher Controls Co., Marshalltown, Iowa, stated: "There have been two hardware items that have grown in significance in the past few years: OCR and COM. OCR places input-preparation responsibility at the source of the data, and removes a level of responsibility by eliminating keypunch.

"COM avoids staggering amounts of paperwork that are common, even with exceptional reporting. A COM viewer gives a manager or engineer the opportunity to view data or drawings without being overwhelmed by paper."

Four Electric Co-ops in Ozarks Find Best 'Program'

Special to Computerworld

Four Arkansas electric cooperatives have found that sharing the cost of developing the major programming for their individual computer installations has saved each of them about 50% in overall programming costs and has been done much more quickly than by "going it alone."

Although the co-ops have a history of working together informally, the joint approach to programming was suggested by IBM, since each co-op was installing a disk-oriented System 3.

"We got the systems we wanted and saved a good bit of money, too, so we'd certainly do it this way again, if the occasion ever came up," said Russel Estes, office manager at North Arkansas Electric.

"We were told we wouldn't have to give up any of our methods, and it turned out that way," declared Otha Law, office manager, Arkansas Valley Electric. "For example, we still bill two cycles a month, while the other three co-ops bill monthly."

"If we had it to do over again, we would work even closer with the other cooperatives," declared Fred M. Prentice, manager of administrative services for Carroll Electric Cooperative. "We got a lot of benefits from this effort – not just in data processing, but a lot of good ideas on general office procedure."

Millard Goff, general manager, Ozarks Electric, said: "The best parts of all our systems went into this – for example, one cooperative was handling adjustments best, and another was prorating bills best."

"The result was a better overall system, still flexible enough to give each of us what we wanted. None of us could have done the programming in our own organizations because we didn't have the trained people. This way, we could buy it and still save more than half the overall programming costs."

At the first meeting, in the spring of 1970, all four signed systems engineering services contracts which provided each with a comprehensive program covering billing, accounts receivable, a customer information file and capital credits accumulation – a $12,000 systems design and programming job for $3,000 each.

Personnel from the co-ops then attended a series of five week-long IBM classes so they could handle some of the programming for small applications, such as inventory, payroll and budgets, themselves. Additional fees subsequently paid IBM for assistance in these programs, and for custom-tailoring the basic billing package, came to between $3,000 and $5,000 for each of the co-ops.

Personnel at all four co-ops emphasize, however, that the real payoff of the new programs lies in their comprehensiveness – the ability each cooperative now has to develop sophisticated engineering reports and customer analyses; the capacity to handle foreseeable growth; and even the potential for teleprocessing.

The jobs running on System 3, not all of them at all cooperatives, include: billing, with all related reports such as the detailed trial balance, delinquency notices, billing register and summary and cash receipts report.

The computer enables the co-ops to include meter readings and receipts up to two or three days before bills go out.

The programs not only save several hundred dollars a month for each co-op in forfeited discounts that slipped by in the past, but also retrieve funds formerly lost through rounding.

Increased accuracy reduces billing adjustments to about one-third their former number, and nearly all adjustments now involve members' errors in readings.

One of the first steps after the programming contract was signed was for an IBM systems engineer to visit each of the co-ops and develop a comprehensive master record that would satisfy all.

The billing register is one of about 20 reports available from the customer master record. This record includes customers' meter serial number, connect reading, deposit, membership fee, type of account, rate code, consumption informa-

Spotlight on Sharing

tion, number of yard lights, revenue for each, codes for city and school district and map location number.

Master Record Vital

This customer master record is already yielding important reports to some of the co-ops, including a monthly customer history, listings of all accounts with no meter reading, printout of all with a balance due over 90 days (in addition to the aged trial balance), listing of customers by map location, alphabetic listing as a cross-reference to the map location, and, probably of greatest potential importance, a variety of engineering reports.

North Arkansas, the first to convert, uses the customer information file to determine the load at any point on the system by each of 10 substations, feeders, phase and line segments.

Carroll Electric is now also producing reports on electric heating installations, and expects to develop a load-building program. This will enable it to concentrate sales efforts in areas not using services, and/or to sell appliances in order to level peaks by time of day and season.

North Arkansas Electric is already simulating various rate structures to see what effect they would have on revenue.

"There is another advantage to each of us in cooperating the way we have," said Prentice of Carroll Electric. "We all use the same basic programs and equipment, so we have handy technical backup. We haven't needed it yet, but if one of us did have a real break-down, we could use another co-op's night shift to get the job done."

"Even though there is much similarity between our cooperatives, we are separate businesses with our own personalities and philosophies, and we emphasize and attach importance to different types of information. This present approach enables us to do that," noted Goff.

"For example, at Ozarks, we are still billing-and-record-keeping oriented because our system is so new. With our own computer we will be able to stress just what we please," Goff added.

"We have never considered using a data center because we want to keep control of our own work," said Law, at Arkansas Valley.

"Ours was the fourth and last co-op to be set up on the computer and we guess we probably got the best deal – we were happy to be last. However, we particularly look forward to the potential of the reports we'll get from the customer file. There's a lot of information we have to supply to engineers now that involves a good deal of tedious digging. This will be produced virtually automatically," Law said.

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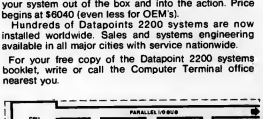

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'Are Programmers Paranoid?'

DP Personnel Conference Topic

TORONTO – "Are Programmers Paranoid?" is one of the topics to be examined at the Tenth Annual Computer Personnel Research Conference here June 15-16.

Paul Armer will deliver the keynote address on Technical Obsolescence, and Robert Dickmann of the Department of Labor will speak on the 1971 Afips Information Processing Personnel Survey.

Societies

The purpose of the conference, sponsored by the ACM Special Interest Group on Computer Personnel Research, is to identify and discuss common problems and needs of those concerned with the selection, training, evaluation and management of DP personnel.

Other topics include "Are Colleges Meeting Industry's Data Processing Needs?", "Industrial Classification of DP Employees," and "Programmers Can Be Cost Controlled."

A panel will discuss data processing certification in Canada.

On Friday morning, three concurrent workshops will discuss personnel relations, personnel research methodology and professionalism.

Dr. Garland Y. DeNelsky and Dr. Michael G. McKee of Cleveland Clinic will speak on "Prediction of Computer Programmer Training and Job Performance Using the AABP Test."

The registration fee for ACM members if $45, $55 for nonmembers and includes conference materials, luncheons and conference proceedings.

Meetings will be held at the Ontario Institute for Studies In Education. For further information contact Fred A. Gluckson, EDP Systems Department, National Bank of Detroit, Detroit, Mich. 48226.

Afips Heads Confer

Keith Uncapher (iaft) has resigned his post at the Rand Corp. to form an Information Sciences Institute at the University of Southern California. The outgoing president of the American Federation of Information Processing Societies (Afips) is confarring with Walter L. Anderson, president of Genaral Kinetics, inc., who will assuma the Afips presidency in July. Anderson served as Afips vice-president under Uncapher for the past yeer.

Simulation Advances Highlight Meeting

SAN DIEGO – "Advancement Through Simulation" is the theme of the 1972 Summer Simulation Conference to be held here June 14-16. The interdisciplinary program includes 36 sessions which are divided into seven topical groups: principles of computer simulation, hybrid systems and simulation, chemical sciences, physical sciences, earth sciences, life science and managerial and social sciences.

Range of Sessions

Sessions, each of which will consist of four or five papegs, include real-time simulation, world and global simulation, computer-sided design electronics, environmental quality and transportation.

Two evening panel discussions will examine "Future Trends In Simulation."

Registration at the conference costs $60 for members of the sponsoring organizations: AIAA, AICHE, AMS, ISE, SCI and Share. The charge for nonmembers is $70.

For further information contact N.L. Dickson, 1972 Registration Chairman, c/o Control Data Corp., 4455 East Gate Mall, La Jolla, Calif. 92037.

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'Computers-Threat Or Promise' Subject Of British Session

LONDON – "Computers, Threat or Promise?" is the subject of a conference on Computers in Society which will be held here July 11-13 under the sponsorship of Infotech Education Ltd.

An international panel will discuss and illustrate the actual and potential benefits of computers in various areas such as medicine, education and local planning.

Assess Dangers

They will also assess the dangers, and examine the responsibilities of government, organizations and individuals that use computers and of the general public, to ensure that necessary safeguards and controls are imposed and enforced.

Right Honorable Kenneth Younger of the Government Committee on Privacy will be one of the main speakers, with Richard Walter, chairman of the British Computer Society's Code of Good Practice Committee and Mike Reid, leader of Realtime, a group of "radical computer professionals."

Harold Sackman of Kansas State University, who has done research on computing and its social effects, and Prof. O.J. Fagbemi of Lago University, an advocate of the computer as an aid in the development of the Third World, will discuss their areas of interest.

Seymour Papert of MIT will describe the incressing role of the computer as a teaching machine, and Prof. Bernard Levrat of Geneva will demonstrate how secondary-level education about computers will result in better man-machine communications in the future.

Further information is available from Registrar, Infotech Education Ltd., Nicholson House, High St., Maidenhead, Berkshire.

SOFTWARE SERVICES

Random Notes

WTSC Disk Utility Aids Isam File Reorganization

PITTSBURGH — An Isam file reorganization feature which cleans up files as they are dumped to tape or disk and restored to the original disk has been added to the DOS Disk Utility System by Westinghouse Tele-Computer Systems Corp. (WTSC).

The new feature also allows the reorganized file to be "restored" to disk extents that differ from those it originally occupied. Thus data sets can be repositioned to optimize their effectiveness.

The $700 utility is available from WTSC, at 2040 Ardmore Blvd., 15221.

NCR Releases BOM Processor

DAYTON, Ohio, — The first module of an integrated software package for medium-to-large manufacturing companies has been released by the National Cash Register Co.

The Bill of Materials (BOM) module requires either an NCR Century 101 or Century 200 processor with a 32K memory and provides a manufacturing company with a listing of all the materials, parts and subassemblies that go into an assembled product.

The module provides a data base for a total system which subsequently will include inventory modules for material control and material requirements planning, NCR said.

Adage Expands Graphics Support

BOSTON — Adage, Inc. has announced its Amos/2 Disk Operating and Monitor System for the AGT/100 Series of Adage Graphics Terminals and to be run on Adage's new lower cost disks.

Amos/2 features a Fortren IV compiler, expended to handle on-line graphics interaction and to include a sub-language for describing images. Adage, Inc. is et 1079 Commonwealth Ave., 02215.

Microdata Adds System Software

SANTA ANA, Calif. — Microdata Corp. now offers simulator SIM16F and cross-assembler AP16DO for the Micro 1600 minicomputer. Both are written in a limited subset of Fortren IV for operetion on large-scale CPUs.

Simulator SIM16F is peremeter controlled to permit the simulation of standard Micro 1600 options.

Cross-assembler AP1600 requires four standard Fortren tape units for all I/O. It is designed in functional modules for simplified maintenance and greater adaptability to user machine configurations and special requirements.

Documentation Vital

Projects Must Be Defined, Controlled

By Don Leavitt
Of the CW Staff

CAMBRIDGE, Mass. – Software production is rooted to the output of people, and people – left to their own devices – tend to be imprecise in their communication with each other. Therefore, DP managers must impose controls and reviewable work plans for every development project, according to ADL Systems Inc.

There are five stages in any software project, a spokesman said, and the requirement for written documentation must start right at the systems planning stage. This is when overall targets, the major applications to be developed and the resource allocations for the job are first discussed.

Understandings Degenerate

"General understandings" at this stage, unsupported by specific documents, tend to degenerate into sometimes sharply differing points of view by each of the people involved and, again, by each of their subordinates, ADL warned.

The need for reviewable work plans extends into the development of functional specifications, when the system is defined from the user's point of view, and into systems design, when the user's specifications are converted to structures that can operate within the computer's capabilities.

Detail design and implementation, and testing operations, must also be fully documented or management loses control of a project, the company emphasized.

A system of memo reports can cover most of the minor milestones, but more elaborate reviews are suggested for major achievements in which complex integrations are involved.

By breaking tasks into identifiable segments, no one of which represents more than 2% to 4% of the total, managers can avoid the trap of thinking that because 80% of a budget has been expended, 80% of the work has been done, a spokesman said.

ADL Systems goes into more detail about managing software work in the latest issue of the Casebook newsletter for senior executives, available free from Acorn Park, 02140.

'Minicomm' Swaps CRT Inquiries, Batch Work, in 24K Under DOS

NEW YORK – Users with no more than a 24K IBM 360/22 can gain on-line capabilities through CRT terminals, without interrupting batch DP work, by using the Minicomm software from Programming Methods Inc. (PMI).

Using a core-sharing technique, it will control up to 99 CRT application programs written in BAL, Cobol or PL/1. An interface is also available to operate RPG as well, so there is no programmer reorientation needed to go on-line, the company said.

Roll-in/Roll-out

Minicomm generates an internal roll-in/roll-out library of the on-line application programs, which is said to cut response time by avoiding the repetitive loading of programs from the DOS Core Image library, and the opening and closing of external files for each use.

The system comes in two compatible versions. Minicomm/I is available for Model 22, 25 or 30 users with as little as 24K of core. It simulates the multiprogramming environment so there is no need to implement IBM's Multiprogramming DOS supervisor which would require more core, PMI said.

Minicomm/II utilizes the standard DOS multiprogramming and provides a communications monitor capability in only 2K of the on-line partition, a spokesman explained.

Minicomm/I can be purchased for $8,000; Minicomm/II for $10,000. Payout lease plans are also available.

PMI is at 1301 Avenue of the Americas, 10019.

'Daps' Checks 2314, 3330 Units

SANTA MONICA, Calif. – IBM 360/370 users operating under OS can identify and correct ineffective data set organizations with the Direct Access Performance Software (Daps) recently released by Allied Computer Technology Inc. The package is designed to work primarily with 2314- and 3330-type devices, the company said.

Daps is a one-pass system that captures and reduces to report form the number and sequence of disk accesses. The package also provides the same type of information about tape drives, so that the user gains an overall picture of his I/O utilization, and the ability to optimize control unit and channel loads as well as volume organization.

The package is limited compared to some other monitor systems that record CPU as well as I/O times, but the company says that poor disk organization is responsible for 70% of system throughput problems. Therefore, proper use of this measurement tool would solve the majority of most users' problems in this area, according to the company.

Daps can operate as either a problem program or a system task, at the user's option. It runs under OS/360 in MVT or MFT environments, including Asp, Hasp or Lasp, but it may not be time-sliced or rolled in and out.

The data extraction and reporting adds an average of 15% to systems overhead, dependent on sample time and run duration. The memory required is variable and depends on the number of devices being monitored and the reporting options chosen, the company noted.

Written in Assembler F, G or H, Daps sells for $3,500 and delivery can be made in 10 days.

The company is at 1610 Twenty Sixth St., 90404.

S/3 Applications Mailed to User

More vendors seem to be providing the IBM System 3 user with basic accounting applications at extremely reasonable cost. Engineering Computer Systems Inc. (ECS), Lexington, Mass., now has accounts payable, general ledger and payroll systems, each for less than $500.

Granat Data Corp. in New York City also has a payroll system for under $1,000.

The payables package from ECS outputs 11 weekly and four monthly reports, as well as three on request basis. It uses three major files, for vendor master records, document numbers and account numbers. Written in RPG II for the 3/10, the $245 package requires 12K memory in a card configuration, 16K in a disk-based system.

The general ledger package also uses 16K of a disk-oriented 3/10 to generate 10 reports including trial balance and profit-and-loss statements. It also costs $245.

The ECS payroll system has the same core requirements as the payables package.

It costs $385 and, like the others, is mailed to the user within 48 hours of receipt of the order at 21 Worthern Road, Lexington, 02173.

The Granat payroll system produces all the conventional reports and government forms, and allows for 11 types of deductions and processing of multiple companies in a single run.

The basic package runs on either a 3/6 or 3/10 and costs $850. It is available from Granat at 2061 Broadway, New York, N.Y., 10023.

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UNIQUE FINANCIAL REPORTING SYSTEM INSTALLED AT CABOT CORPORATION

Boston, Mass. — A General Ledger software system that utilizes a unique chain file organization to gain random access capabilities has been successfully implemented at the Cabot Corporation's headquarters computer center by a client/Software International Corporation team.

According to Mr. Robert T. Webb, Cabot's Manager of Systems and Programming, "This is the first time we have used a chain file Bill of Material Processor technique for purely accounting applications. Nevertheless, the General Ledger was installed quickly, and we now have an extremely flexible and responsive accounting system."

Many users access data base

Mr. Webb described the primary challenge as "a need to design a system that could satisfy a large number of different users. For example, we report for eight domestic operations on the system, plus nine overseas operations. All these divisions need different reports for varying reasons, but we found they could all work from the same data base. That is, if the data base could be easily accessed."

The varied needs reflect the company's breadth: Cabot is a world-wide producer of carbon black, titania, silica, oil and gas, liquified natural gas, oil field equipment, nickel-based super alloys, and plastic dispersions.

"The Software International General Ledger," said Mr. Webb, "gives us the flexibility we need. To begin with, it offers up to 99 levels of summarization, and we can have account numbers of virtually any length. The BOM Processor technique provides chaining capability which eliminates the need for the account number to determine sequencing."

Budgets prepared in record time

As an example of the improvement made in computer services through the installation of the General Ledger package, Mr. Webb cited the preparation of the Carbon Black Division budget.

"Before we were fully computerized," he said, "management was presented with budgets largely prepared by hand. If someone wanted to see the effect of a variable we literally had to redo the whole budget. This could sometimes take several weeks!"

"Now," he concluded, "we generate more than 95% of the budget as printout. When variables are introduced, we can have new data ready in just hours."

The General Ledger Package installed at Cabot Corporation headquarters operates on an IBM S/360-30 with 64K of core.

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Dataware Assembler-Cobol Translation Handles All Standard DOS, OS Macros

TONAWANDA, N.Y. – An IBM Assembler language-to-ANS Cobol converter is available as a service from Dataware Inc. All coding that can be supported in ANS Cobol, including standard DOS and OS macros, is converted. Any mix of Basic Assembler and Assembler can be handled, the company said.

The converter uses a simulation technique to scan and interpret logic sets in the Assembler program. It does not convert on a one-for-one basis, but analyzes all source statements before generating the Cobol code.

The service is said to be able to convert the most difficult program logic including address modification, subscripting and base register usage. The converter translates 90% to 95% of the Assembler language source statements for normal application programs, Dataware claimed.

The system uses the programmer's original labels, when available, in the generation of Cobol statements. It also produces a cross-reference listing in which Assembler statements and the generated statements are listed side-by-side. Suspect or unconverted statements are flagged on the listing.

The service is available under three plans. The first provides simple conversion. The customer is provided with a translated Cobol punched deck, generated Cobol listing with Assembler statements and diagnostic aid messages and a cross-reference listing.

This plan costs 30 cent/source card, plus machine time charges ranging from $50 to $150, depending on the size of the original Assembler program.

The second plan converts the Assembler programs, corrects the diagnostic messages and takes the generated Cobol program through clean compilation. The third service provides complete conversion and implementation of users' systems. The prices for these services are negotiable depending on volume.

Dataware Inc. is at 495 Delaware St., 14150.

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'Abis' Controls Clothing Manufacture

VAN NUYS, Calif. – A management control system for clothing manufacturers, the Apparel Business Information System (Abis), is available from Universal Computer Sciences in either ANS Cobol or RPG for use on most CPUs.

A modular package, Abis includes order entry, inventory control, invoicing and credit memo preparation. Other modules support an accounts receivable application, and sales analysis and other management reports.

Inventory control under Abis extends from monitoring of shelf stock, including reordering when appropriate, to control of work in process. Reports of work on the factory floor are reported by work station and by finished goods, the company said.

Versions of the system have been written in RPG or Cobol for use under DPS on the 360/20.

The RPG version, including some 80 programs in the complete system, sells for $16,500 plus installation, or approximately $3,000/module.

The firm is at 14920 Oxnard St., 91401.

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ComData Corporation

Portec Evaluates COM for Banks, Offers Software and A/V Seminar

SANTA ANA, Calif. – Portec Corp. is offering the Bancom service that includes an on-site study of a bank's management information systems, a software package for computer output microfilm (COM) systems specifically designed for banks and financial institutions and an audio/visual COM systems seminar.

The study results in a comprehensive report on utilization of COM systems and covers the impact COM will have on a bank's current system, the most effective way to implement a COM system and plans for future expansion of a COM system.

The second part of Portec's Bancom program is Comtreve, specially designed COM software. Outputs of the package include a daily demand deposit accounting mini-statement which eliminates printing a balance report, an activity report and a cycle end statement.

Portec is at 17112 Armstrong Ave., 92705.

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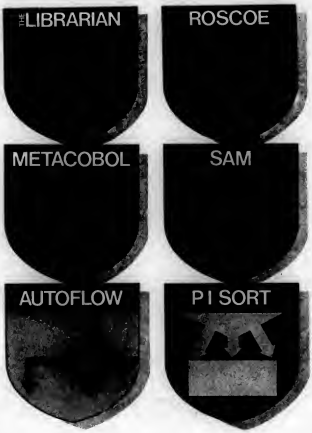

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COMMUNICATIONS

Data Briefs

FCC Approves Third Link In MCI Microwave Net

WASHINGTON, D.C. – The FCC has approved the third link in the proposed Microwave Communications Inc. (MCI) national microwave network. The latest route includes 85 tower and terminal sites between New York and Chicago. MCI is now in operation between Chicago and St. Louis.

Known as MCI New York West, the link could be in service by the and of this year. Another route between New York and Washington, D.C., has already been approved by the FCC. The commission is expected to next consider MCI North Central and MCI New England, according to an FCC staff spokesman.

If current construction schedules are met, MCI users could be transmitting data from the East Coast to St. Louis by early next year, according to one observer.

Test Set Displays Error Rate

MOUNTAIN VIEW, Calif. – A data transmission test set that displays the error rate of the communications line is available from Antekna Inc.

When data transmission stops, the 221 operating in conjunction with a similar unit at the remote end of the line tests both modems and the line. Both send and receive lines can be evaluated via a series of test patterns initiated via pushbutton on the front of the 221.

The test set is designed for operation on full duplex synchronous private lines and is compatible with Bell 201, 203 and 303 data sets, or their equivalent from independent suppliers.

During normal transmissions, the test set monitors the operation and when an error problem occurs, one of 20 indicators on the front panel can isolate the fault for the operator. The 221 is compatible with RS-232 and Bell 303 interfaces and is normally installed between the data terminal and the modem, according to the company.

The unit costs $2,500 and a simpler version for installation at remote sites is priced at $1,700. A strip chart recorder for line monitoring costs $750. First deliveries of the 221 are scheduled for July from Antekna at 625 Clyde Ave., 94040.

Tycom 37 Handles Full Ascii

POMPTON LAKES, N.J. – A remote batch terminal with Selectric typewriter and Philips-type cassette unit has been introduced by Tycom Systems Corp., a subsidiary of Terminal Equipment Corp.

The Tycom Model 37 can transmit stored data from the cassette at an optional 1,200 bit/sec using the full Ascii character set, a spokesman said. Transmission at 300 bit/sec is standard. The cassette can be controlled remotely from the Selectric keyboard and up to 200K characters can be stored. A control unit contains a 200-character buffer and an acoustic coupler to connect the terminal to a dial-up phone line.

The cassette unit allows high-speed numeric searches, of data on the tape, hard-copy printouts of stored date and local text editing. The control unit also includes a status display for operators.

The Model 37 with Selectric typewriter, cassette unit and acoustic coupler costs $5,500 from Tycom Systems at 750 Hamburg Tpke., 07442.

3705 Replacement Processor Offered

PALO ALTO, Calif. – An independent replacement for the IBM 3705 front-end communications processor will be available late this year from Prentice Electronics Corp. It will support up to 352 low-speed terminals.

Using dual CPUs, the Prentice P-3000 Controller will offer users savings of 15% to 26% on 12-month rentals and savings from 35% to 40% on purchase, the firm said. The company will also offer a 24-month rental plan similar to IBM's extended-term lease.

The Prentice controller will include a Microdata processor with 240 Kbytes of 1 µsec, 8-bit core shared between the two master/slave ROMs. A full line of disk, magnetic tape, card readers and printers will be available with the P-3000, and users will also be able to attach their own EIA plug-compatible peripherals, a spokesman said.

Software support with the P-3000 will include 270X emulation, a supervisory monitor and a communications network control program, all with diagnostic programs.

Independently programmable Interfaces will be available for both asynchronous and synchronous devices. The asynchronous interface will include program control for each channel. Operation can be in one of eight data speeds and one of four data transmission codes, the company said.

The P-3000 will support 5-, 6-, 7- and 8-bit level data translations to make the controller compatible with most codes including Ascii and Ebcdic. Asynchronous speeds from 75 to 2,400 and synchronous speeds from 2,400 up to 50 kbit/sec can be handled by the controller, the company said.

About 20 models will be included in the P-3000 line ranging from a cost of $37,000 to $140,000 with monthly rentals from $840 to $4,200. The IBM 3705 rental range is $1,390 to $10,940/mo with purchase from $57,000 to $449,000. The Prentice controller will be available from 796 San Antonio Road, 94303.

'Clean Signal' Cited

WU Set to Offer Digital Data Services

By Ronald A. Frank
Of the CW Staff

MCLEAN, Va. – Western Union plans to offer new private line and dial-up communications services tailored to computer users within the next 18 to 24 months.

By this summer, WU expects to initiate a private line service, Multipoint Data Service (MDS). At first serving about 45 to 50 cities, MDS will provide minimal error rates and low-noise channels, according to Harold R. Johnson, vice-president of service planning and development. The higher quality lines will result from signals which are "digitally regenerated" at repeater points in the WU microwave network, Johnson said.

While other carriers simply repeat and amplify analog noise levels, the MDS regenerative method will mean that less noise will enter the computer, Johnson said.

The "clean signals" have already been field tested by a large eastern insurance company with "fantastic results," according to the user.

The MDS service will be designed for private line users with on-line teleprocessing, data collection and remote batch applications. The service will be offered at 2,400 and 4,800 bit/sec, if current WU plans are approved by the FCC.

Expand EDS Service

In the area of dial-up offerings, WU plans to expand its Electronic Data Switching (EDS) service to 2,400 and 4,800 bit/sec speeds. Described as a circuit-switching service, the EDS high-speed offering will connect TWX and Telex users via direct dial-up facilities, Johnson said.

The higher dial-up speeds means that users will have to install faster terminal equipment. "We do not intend to restrict the types of terminals that can be used," Johnson said. The carrier intends to offer an interface that "will standardize the user's equipment so it can be switched through a common network," he added.

Part of the WU offerings will be based on a new multiplexer patent, recently awarded to Russell G. DeWitt. Known as minimum cost time division multiplexing, or "mint" the method allows 168 channels to be packed onto T1 carriers. The multiplexing methods will initially be used to derive additional channel capacity on 200 bit/sec teleprinter circuits, according to DeWitt, manager of time division systems engineering at the WU Technology Center.

Although WU customers will have to continue using modems for another five to eight years, according to Johnson, some alternatives are already being considered. A new form of "baseband transceiver," probably priced lower than today's modems, will be used, according to DeWitt. These Data Loop Transceivers will make it easier for users to connect custo mer-provided equipment to WU digital links, DeWitt predicted.

High-Level Language Coding Could Speed Data Software

ATLANTIC CITY, N.J. – While there are advantages to writing communications software with higher-level languages, most users are still using assembly-level programs.

This opinion was shared by most of the 20 attendees at a recent meeting of the ACM's special interest group on communications (Sigcomm).

Software Criteria

Describing an experimental communications language developed at Bell Labs, Dr. David Opferman listed the important criteria for communications software: extensive use of subroutines; large call processing and maintenance programs; and few special instructions.

While advocating the use of higher-level languages for data software, Opferman pointed out there were also disadvantages such as a decrease in real-time capacity, loss of generality and an increase in the memory size required.

There are no commercial machines capable of handling the experimental PL/1-type language developed at the Labs, Opferman said, but Bell is planning to break away from assembly-level communications coding to the use of a "higher" intermediate macro-level language.

Paul Bliss, vice-president for programming at Intercomputer Corp., told the ACM members that programs generated by a higher-level language often result in a compiler that runs more slowly than assembly-level coding.

While high-level language programmers can optimize their coding on the algorithm level, sometimes assembler programs are still faster, he said. There is a great need for a standardized higher-level language for communications software, Bliss said, but he noted it is doubtful that such standards will come soon.

While users can afford to use higher-level languages for business applications, the more rigid demands of communications software often require assembly-level coding, Bliss added. As the complexity of a communications software system increases, Bliss said, consideration should be given to higher-level languages since they can be more efficient with lower programming costs.

An attendee noted that programming costs are often tied directly to the skills of the programmer, and Bliss agreed.

John Bracket of Varian Data Systems said vendor-supplied diagnostics for communications software should be studied by users when operating troubles occur.

The diagnostics often give a good indication of the proper way to respond to software problems, he said.

Communications programs should be patterned around a "two-day loader" that allows the remains of a front-end processor crash to be generated into a file in the host CPU, Bracket suggested. This method will also allow object code for the front-end processor to be generated in the host CPU, he said.

Interdata Upgrades 270X Unit

OCEANPORT, N.J. – Interdata Inc. has upgraded its 270X transmission control unit by adding a Model 55 processor.

The 270X enables various IBM 360 and 370 CPUs to communicate with non-IBM terminal equipment without modifications to the IBM software. The 270X is a replacement system for IBM 2701, 2702 and 2703 control units. Interdata said the system offers cost savings and improved performance.

The 270X acts like an IBM multiple device address control unit on the multiplexer channel, according to Interdata. Among the capabilities of the 270X, not matched by comparable IBM units, are front-end editing and code conversion, and the emulation of IBM equipment when independent terminals are used.

Software available with the 270X includes a scheduler, command processor, console controller and data set line controller. Also available are optional Bell 103/202 data set adapters for asynchronous operation and Bell 201/301 adapters for synchronous operation.

The 270X provides automatic equipment for both inward and outward dialing systems and operating system support is available to use the front-end processor in a free-standing mode separate from the host 360/370.

The basic 270X with dual 8K core memories costs $49,900 including console TTY and 360/370 interface. Memory expansion modules are available in 4K increments at $2,700. The system is available in 90 days from 2 Crescent Place, 07757.

Bits & Pieces

Turnkey Medical System Based on DEC PDP-11

WAKEFIELD, Mass. – The turnkey AHS-11 Mumps System from Automated Health Services, Inc. includes a DEC PDP-11 with full language features, four user terminals and a 128K byte disk. This high-level language, interpretive, time-shered operating system is designed for patient interviewing, history creation and modification.

Complete with hardware, software, CRT and keyboerd printer terminels, and two-year software warranty, the system costs $48,500 from 607 North Ave., 01880.

Add-On Memories Add to Line

LOS ANGELES – A new full line of add-on memory units for the DEC PDP-11 minicomputer hes been announced by Information Control Corp.

Supplementing the Corpak 11A, the new line allows the user to select the memory cycle time at either 1.2 µsec, 950 nsec, 600 nsec or 475 nsec.

The Corpak 11A has the standard 1.2 µsec end Corpak 11B has a cycle time of 950 nsec. The Corpak 11AX and 11BX are interleaved memory systems. The 11AX has a 600 nsec cycle time into memory and 800 nsec out. The 11BX features 475 nsec into memory and 800 nsec out.

All of the units can be used to increase the PDP-11 memory capacity to 128K, end are available in 4K by 16-bit read/write stack assembly increments.

The Corpak units are 19 in. reck mount; 10-1/2 in. high and 20 in. deep.

The firm is at 9610 Bellence Ave., 90045.

Reader Displays Full Page

LINCOLNWOOD, Ill. – The Bell & Howell Briefcase Reader is described as the smallest microfilm reader which displays e full-sized 8-1/2 in. by 11 in. page.

About the size of a dictionary (3-1/2 in. by 9-3/8 in. by 10-1/2 in. when collapsed), the Briefcase Reader weighs approximately 5 lb. It is designed to be used with standard microfiche (4 in. by 6 in.).

Other features include:

- A single control indexes and locates image.
- The image on the screen moves in the same direction as the control.
- Fingertip focusing and high gain screen are provided.

The unit, available by the end of this year, will sell for under $100 from 6800 McCormick Ave.

Scanak Enhanced

Input System Combines OCR, Key Entry

CHICAGO – Users will be able to combine key/disk entry with OCR input in the same off-line data preparation system from Cummins-Chicago Corp.

The company has added a processor, peripherals and key-input stations to an enhanced version of its Scanak reader to complete the Cummins 4400 Peripheral Processing System.

The Scanak is available in 3-pocket, 6-pocket (with three for reading ticket-sized documents) and 13-pocket versions. The fonts now include numeric sets of OCR-A, OCR-B, IBM 1403, Farrington 7B, IBM 1428 and E13B Micr which are read optically. The device can also be equipped to read Micr magnetically, in parallel with the optical reading of the same font on the same document. Maximum rate is 700/min for 6-in. documents.

Two fonts are standard and two more can be added.

The processor, a 16-bit minicomputer, is used in a byte mode. Core memory is available in capacities from 8K to 128K bytes and cycle time is 700 nsec.

The 4400 system will be available with two different disks. The first, a non-removable moving head drive, has a capacity of 2.5M bytes. The other has both a fixed and a removable disk, each holding 2.5M bytes. Average access time is 60 msec for each. Up to four drives in any combination can be attached to a controller and an unlimited number of controllers can be attached to a system, the company said.

A variety of 37.5 in./sec tape drives can be attached to the system.

Journal tapes can be prepared at 1,800 line/min on one of the two printers offered. The other is a 132-column drum printer rated at 600 line/min. OCR-A font ia optional on the line printer replacing some of the usual special characters.

Two Formats

The data entry keyboards are available with either keypunch or typewriter formats, with an adding-machine 10-key pad optional. The CRT screen with which the units are equipped has a capacity of either 480 or 960 characters.

Communications facilities to handle lines up to 9,600 bit/sec can be attached.

A system with eight input terminals, a 2.5M byte disk and controller, 7-track tape drive and controller, line printer, 16K processor and a 3-pocket Scanak with two fonts will rent from $2,925/mo. Deliveries will begin during the fourth quarter of 1972 from 4740 N. Ravenswood Ave., 60640.

Nasa Installs Laser Mass Memory For Illiac IV, More Changes Planned

By Frank Pisata
Of the cw staff

MOUNTAIN VIEW, Calif. – With the installation and acceptance of the Unicon "trillion-bit" laser mass memory at Nasa's Ames Research Center the Illiac IV computer has moved a step closer to completion.

The memory was delivered to Nasa by Precision Instruments last October but was not accepted by Nasa until about a month ago, according to a spokesman.

Illiac Waits

The Unicon is currently connected to a DEC PDP-10, which will in turn be connected to the Illiac IV when it is ready. "I don't know when Illiac will work, but we'll start to do things in about six weeks," the spokesman said.

This will involve physically moving both the PDP-10 and the Unicon memory to the Illiac site, he explained.

The Unicon is currently being used in much the same way a large disk is used, the spokesman said – to store program files. It will be used also for breakpoint storage during Illiac "confidence tests" or during long computational runs, he continued.

The large masses of data involved in these applications will require the capacity of the Unicon, in spite of the fact that data is not erasable in the laser device, the spokesman said.

He pointed out that some of the data could be used as input to other programs and the cost of each strip was less than $40 for a capacity of about 2 billion bits. Nonetheless, "we would certainly be careful about what we used it (the Unicon) for," he added.

Nasa is considering some changes in the Unicon to make the device more suitable for the rewrite usage. These changes would achieve a larger storage capacity, higher reliability and improved error rate.

The installed unit has not been run long enough to have established reliability records, the spokesman admitted, but the device would probably achieve its published crror rate of $1:10^9$ bits. "But from our point of view, we don't consider that good enough for our application," he added. "We would like to get up to $1:10^{14}$ bits, and we think we know how to do that," he claimed.

A Second Laser?

Changes considered include the addition of a second laser, changes in the error-correction coding and improved environmental conditions in which the unit is installed to increase reliability.

The actual capacity of the Unicon is about 700 billion bits, according to the spokesman. Data can be accessed in blocks of 128 32-bit words. The 20 msec average access time of the drums can be overlapped completely with the second drum and with computation, he said.

The Nasa spokesman refused to divulge the price paid for the Unicon. He estimated, however, that commercial units were being offered for about $1.6 million.

Mini Features Memory Options

FAIRFIELD, N.J. – Digital Computer Controls, Inc. has introduced the D-112H/SC which it calls the most powerful and fastest 12-bit minicomputer available.

The new mini, compatible with the DEC PDP-8, can combine 900 nsec core memory with high-speed semiconductor RAM (random access memory) to allow a cycle time of 200 nsec in the same computer.

The D-112H/SC can combine memory types because it is able to perform in two different timing modes. The normal mode applies when the processor is referring to the 900 nsec core and the fast mode when the bipolar semiconductor memory is referenced, the company said.

Special "look-ahead" circuitry recognizes whether the next instruction address is in the semiconductor or in the core memory. The fast mode incorporates instruction overlap in order to arrive at a microinstruction execution time of 200 nsec, the company explained.

During an overlap operation, the machine can perform the following steps simultaneously, the company explained: increment the program counter, fetch current instruction from memory, execute an arithmetic operation from previous instruction and compute the next instruction address.

The basic version of the D-112H/SC has 4K words of core memory in 4K modules, with a capacity of 32K words. Semiconductor memory is available in 256-word increments. Each 1K words of semiconductor memory added replaces a 4K module of core, the company said.

The mini costs $5,900 for a 4K core unit. Bipolar memory Is priced at $1,400 for the first 256 words and $700 for each subsequent 256-word increment. Delivery is 45 days from 12 Industrial Road, 07006.

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Tape Library Automation System Mechanizes Handling, Recording

MOHAWK, N.Y. – A low-cost tape transportation system from Advanced Digital Systems, Inc. (A-D-S) puts the tape library "on-line" by physically delivering tapes from secure vaults to the operator for mounting. Thus, the manual chores of handling and recording of tapes are eliminated for the librarian, the company said.

The LCS-7 Automatic Library Transportation and Administrative System combines software with hardware to perform the total librarian task. Designed to handle relatively small libraries of 1,000 to 6,000 active tapes with a usage of 200 tape/day, the LCS-7 delivers tapes automatically to the front end of a locked security cabinet, displays the tape drive number for mounting and lights a "ring" light for writing – all under mainframe or minicomputer control.

Record Keeping

The LCS-7 is a delivery, retrieval and record-keeping librarian system under computer control applicable to all tape library operations. The library is on wheels for flexibility and adaptability to floor layout configuration changes.

A-D-S LCS-7 automates tape library operation.

A modular approach in hardware and software lends additional ease to future change, the firm said. Suited for full operating systems such as OS, Exec VIII and Gecos, a communications channel from the mainframe gives minicomputer control of all mount, demount and update requests, the company said.

Prices range from $620/mo for a 1,000-tape hardware and software library automation system to $125/mo for the tape librarian software alone.

Advanced Digital Systems, Inc. is at 146 W. Main St. 13407.

Programmable ROM Added to Modcomps

FORT LAUDERDALE, Fla. – Modular Computer Systems has introduced a programmable read-only control memory, permitting the Modcomp computer user to field-implement microprogrammed firmware.

The bipolar, solid-state Modcomp ROM is available in modules of 256 words by 40 bits and is expandable in 256-word increments up to 1K words. Each 256-word module costs $2,500.

The individual integrated circuit chips, 256 words by 4 bits, can be programmed by the customer using an inexpensive, commercially available device, the company said.

With the introduction of Modcomp programmable ROM, the user now has available all the features of a standard, software-supported computer plus the capability to add and alter microprogramming tailored to his specific application, a company spokesman said.

Modular Computer Systems is at 2709 North Dixie Highway, 33308.

Cambridge Doubles 360/22 Core Capacity

NEWTON, Mass. – An add-on core memory system that extends the main memory capacity of IBM 360/22 computers to 64K bytes has been introduced by Cambridge Memories, Inc.

The Model CC22 is the fourth add-on core memory system in Cambridge Memories' 360/Core line of compatible replacement or expansion memories for 360 computers. Other 360/Core models are available for 360/30s, 40s and 50s.

The CC22 is housed in a desk-top cabinet and enables Model 22 users with rented, purchased or leased systems to double the size of their core capacity beyond IBM's maximum main memory limit of 32K bytes. The CC22 can expand existing Model 22 core from either the 24K byte or 32K byte sizes offered by IBM.

The units have been priced by the company to make it more economical for the user to add additional core to a 360/22 than to switch to a 360/30 to obtain needed additional capacity, the company said.

A memory increment to raise the capacity of a 360/22 from 24K to 64K rents for $1,060/mo on a one-year lease plus $30/mo for maintenance. A 32K increment to boost system capacity from 32K to 64K costs $840/mo plus $30/mo, on a one-year lease.

An installation charge of $675, made on equipment on one-year leases, does not apply to longer-term arrangements, the company pointed out. Purchase prices have not been set, the company said.

The CC22 is available on 30-day delivery from 285 Newtonville Ave., 02160.

3M Viewers Shown

ST. PAUL, Minn. – Two new computer-output-microfilm (COM) readers, the Consort and the COR-701, are available from 3M Co. While both readers are designed for microfiche, the COR-701 also accepts cartridges.

The COR-701 is a general-purpose reader with automatic film threading, 360-degree image rotation and a 12-in. by 17-in. viewing screen.

The other 3M reader is the Consort, which features a "floating" lens system that assures constant focus. Microfiche and jackets generated at either 24X or 42X reductions are projected 3/4-in. size on the 9-in. by 11-3/4-in. viewing screen. Indexing grids are available for either ratio.

Prices are $145 for the Consort and $895 for the COR-701.

Modular Storage System Makes Printout Accessible

CHICAGO – Wilson Jones Co. has developed a modular system of low-cost cabinets that provide storage and access for bound volumes of computer printout along with table-top height work surfaces.

Called the Data Center II, the modules are designed to get maximum use from a given floor area in the EDP room or office while providing easy access to printed data.

The units feature the company's three-way retrieval suspension system for printout storage in cabinets with wood-grained, desk-like tops.

The price of the 37,000 page unit is $195. The 24,600-page module costs $130. The expansion modules are $70 each. First shipments will take place in June from 6150 Touhy Ave., 60648.

Two Years Ago, Almost

Including us. A digital cassette recorder. Seemed like a great idea at the time. But there was too much garbled info. And lousy reliability. A bumper crop of real lemons.

Well, we licked our wounds along with everyone else. But we also went back to the drawing board because we still thought the basic idea was sound. And we came up with a unit that really works.

A Whole New Concept

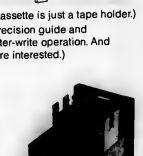
To get super reliability, we reasoned, you have to control that tape. So, we started from scratch. Got rid of the traditional pinch rollers, belts, solenoids, levers and mechanical linkages from the transport. Took out the head guide forks.

Eliminated the need for pressure pads. Those were the main cause of head and tape wear, oxide shed and dropout.

Then, instead of just pushing the head up to the tape as it rolls by, we decided to get the tape out of the cassette. (That way the cassette is just a tape holder.)

So we designed two little fingers that pull the tape down past the head, over a precision guide and around a capstan. That maintains optimum head wrap angle – critical for read-after-write operation. And it's all done automatically as you load. (We've got a patent pending, in case you're interested.)

The Insides



Next, we put in three DC motors. One for the capstan and one for each reel. Servos positively control tape tension on both sides of the capstan. And tension sensors confirm proper loading to BOT – no writing on tape leader. There's no drag on the tape. Ever.

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Library Systems--Part III

National Plan Needed to Test Information Services

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – A national pilot project is needed to test the effectiveness and overcome the problems associated with the application of computer technology to libraries and other information services, according to the Computer Sci-

Parts I and II [CW, May 3 and May 17] of this series discussed the problems currantly hindering the application of computer technology to the nation's libraries, including lack of national coordination, expense of past systems and human and administrative resistance.

ence and Engineering Board here.

"The present collection of localized and fragmented efforts must be guided toward harmonious integration through experience with a comprehensive pilot system," the board, a unit of the National Academy of Sciences, said.

The pilot system must be "of a scale sufficiently large to model accurately those critical operational problems that typically fail to appear in small systems, yet whose absence produces misleading results," the board said in a recent report entitled *Libraries and Information Technology: A National System Challenge.*

To be comprehensive, the report said, "a pilot system must account for all the categories of functions inherent in a national information system.

Operational Needs

"To be realistic, the pilot system must incorporate files of sufficient subject coverage and contain information published over a sufficient period of time, so that users will depend on it for their operational needs; it must cover sufficiently heterogeneous subject areas so that conflicts in special needs are encountered for resolution."

There is also a need for increased stress on scientific design and modeling studies of broadly based information networks in order to develop "information systems consistent with geographic dispersion of information resources and information users," the study said.

"At least the following technical aspects must be addressed for any type of network: information flow facilities and patterns, intellectual and physical access dynamics for individuals and for organizations, file maintenance patterns, file and process backup arrangements and an appropriate balance between automatic and manual processes."

In addition, the report recommended specific targets in the "development and employment of computer science, engineering and related technologies in information systems."

The library and information systems community needs to provide guidance for systems software projects in order to ensure that these projects satisfy their requirements, the report went on.

In addition, the requirements of the "library community for large and low-cost storage facilities will probably exceed the needs of scientific and commercial applications. Great care must therefore be taken to ensure that development is not slowed down prematurely."

It is also necessary "to explore the specific conditions under which electrical transmission becomes economically competitive with local facilities and physical transport and/or enables sufficient savings to be realized in development and operations to cover its cost.

"This is a specific factor to be examined for the full operational system and one to be tested in the (proposed) pilot system, the report stated.

In the area of microfilm, the report noted that "microform technology will be important as a primary (storage medium for automated information systems until the costs of input and storage of digital forms come into an acceptable range.

Ensure Compatibility

"Hence, specific attention must be given to ensure both the availability of information in microform and the necessary degrees of compatibility between microform and computer technology."

The library community must also begin planning to extend the general library functions to handle machine-readable sources of information, including semi-processed material (e.g. census tapes), highly refined and validated data . . . and published information as it becomes available in machine-readable form."

There is also a need for education in the field of computer use in libraries, the report continued.

"Key workers and managers involved in building and operating segments of the national information system must be provided supplementary knowledge and training in one or more areas outside their respective primary fields," the board said.

The board did not name a specific institution to direct the projects in the area of computer-based information systems, but noted "it is clear that these actions must be taken by an appropriate national body that has the means to provide the necessary cohesiveness and continuity on a national scale."

In conclusion, the group said that "if the necessary national impetus cannot be generated and joined by the relevant institutions as participants, to produce better operational results than are possible by working separately, then no matter how many studies, or reports or plans are made or good intentions expressed, the needed, expected and possible improvements in information handling and supply through the use of computers and related technologies will remain a distant vision."

Student Job Service Launched

LONDON – A service to help students find jobs has been jointly developed here by employers, university career advisers and student union officers.

The computerized service will begin on a trial basis with 16 universities and over 100 employers.

Employers complete forms describing job opportunities and requirements. The student fills out a similar form listing job desires and qualifications. The forms will be matched anonymously by the computer; each student will receive a list of 20 prospective employers and each company receives 50 prospective recruits.

The service is operated by a non-profit organization called the Standing Conference of Employers of Graduates. It is free to students, with funds being provided by the participating employers.

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Shaw Concordance May Be Biggest

LAWRENCE, Kan. – An assistant professor at Baker University has prepared a fifty 7,000 page dissertation, "Concordance to the Plays and Prefaces of George Bernard Shaw," with the help of a computer.

The work contains almost 700,000 entries and is two to three times the size of other giant concordances, such as those of Shakespeare's works and the Bible, according to Dean Bevan, author.

The concordance, which Bevan described as an "ultimate index," lists alphabetically each important word used by Shaw in his writings, where the word is used, and may give the context in which it is used.

Two Million Words

Bevan spent five years on the concordance, and had a keypunch in his home for about a year and a half. Each of the more than 2 million words in 60 plays and prefaces was keypunched. Omitting common words such as 'a' and 'the' reduced the volume by about 60%. Bevan said, but that still amounted to about 140,000 cards.

Without the use of a computer, Bevan said the work might have taken several lifetimes to complete by hand. "Some of the scribes who copied entries for the Wordsworth concordance worked for most of their adult lives, and many died before the work was completed," Bevan noted.

Processing took several nights on the University of Kansas Honeywell 635. The work was published, using photo reduction of the computer printout rather than typesetting the whole work.

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THE AUTHORS

Roger MacGowan is professor of Computer Science with the Dept. of Defense Computer Institute in Washington, D.C. and is a frequent contributor to professional journals.

Reid Henderson is President of Compudemics, Inc., and is both a CPA and CDP. He also lectures at George Washington University and the Industrial College of the Armed Forces.

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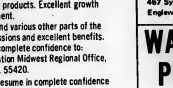

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Potter Introduces 'Floppy' Disk Drive

MELVILLE, N.Y. – A disk drive to handle "floppy" disks is available from Potter Instrument Co. here. Designed to compete with cassette drives, the DD480 features fast random accessing and check reading within 667 msec (one disk revolution).

Packing density for the unit averages 1,295 bit/in. and a disk speed of 90 rpm provides a data transfer rate of 33.3 kbit/sec.

The unit, which is being marketed to key-to-disk makers and terminal manufacturers, will sell for as low as $500 with accessing electronics in OEM quantities, the firm said. The address is 532 Broad Hollow Road, 11746.

Microdata Shows 2 Products

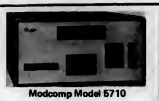
SANTA ANA, Calif. – Microdata Corp. has a dual microprocessor, the Micro 1600D and an I/O byte controller for interfacing the Micro 1600 minis with a variety of I/O devices.

The 1600D features two CPUs, each of which can be microprogrammed and can accommodate up to 4K of control memory. Each has a separate I/O facility as well as separate control memory, the firm said. Memory is expandable to 65K words.

New OEM Products

Price of the basic CPU is $4,995 and a typical system with 65K core memory, 4K control memory for each processor and provision for 64 high-speed asynchronous or synchronous communications interfaces costs $30,000.

The I/O controller operates in three modes: program, concurrent for block transfers or program with interrupt on character transfer complete. Simultaneous and independent input and output operation can be executed in all three modes, the firm said, and all data transfers are in 8-bit parallel byte form.



Modcomp Model 5710

The firm is at 644 East Young St., 92705.

Modcomp Has Terminal

FORT LAUDERDALE, Fla. – Modular Computer Systems has a free-standing process data terminal for use with Modcomp computer systems.

The Model 5710 has a static card reader and a numeric pad and features full-duplex interfacing. There are two output methods: numeric display with decimal point and a 24-position rear projection screen. Selling for $2,000 in single quantities, the unit has serial asynchronous interface, according to the firm at 2709 North Dixie Hwy., 33308.

Potter 'Floppy' Disk Unit

Other New Products

Digital Computer Controls, Fairfield, N.J., has introduced a high-speed, rack-mounted paper tape reader, the PR-1, that can read up to 400 char./sec and is compatible with Digital Equipment Corp., Data General and Digital Computer Controls minis.

– – –

The Compu/Corder 120 system from Sykes Datatronics, Rochester, N.Y., is a magnetic tape cassette system with up to four transports and features transfer rates of up to 12 kbit/sec and start/stop times of 50 msec.

– – –

The 613 Storage Display Monitor from Tektronix, Beaverton, Ore., is designed to offer storage tube display facilities at prices competitive with semiconductor memories. The Direct View Storage Tube, using an 11-in. CRT, eliminates memory devices usually required for refreshment. Price is $2,200.

– – –

Datel System's "N" Series of data acquisition systems, selling for under $500 in OEM quantities, contains 16 channels of analog multiplexing, sample/hold amplifier, 8-, 10- or 12-bit analog-to-digital converter and systems programmer with control and interface logic. The firm is at 1020 Turnpike St., Canton, Mass.

– – –

A direct memory access option has been added to the Naked Mini and Alpha minicomputer line offered by Computer Automation at 895 West 16th St., Newport Beach, Calif. Priced at $500, the DMA provides a cycle stealing, direct memory channel, with data transfer rates of up to 713,000, 16-bit word/sec.

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COMPUTER INDUSTRY

a Computerworld news section about the nation's fastest growing industry

June 7, 1972

CI Notes

Novar System Seized

BARBERTON, Ohio – Novar Electronics Corp. here recently seized a Novar Corp. 770 data collection system in a dispute over the name Novar.

The system was inadvertently delivered to the firm here, instead of to Novar Corp., a GTE subsidiary, in Mountain View, Calif. James Ott, president of Novar Electronics, originally threatened to hold the system hostage until the GTE unit stopped using the Novar name.

Presently, Novar Electronics is protesting the GTE unit's use of the Novar name in the Patent Office. The use of the name is also being protested by Data General, which says it conflicts with its trademarked "Nova" name.

Ott now says he will return the system while the issue over the names is being resolved.

One Show Shows Upward Trend

LOS ANGELES – Apparently one trade show will do fairly well this year.

While most conferences are reporting falling booth sales and dropping attendance, Wescon, slated for Sept. 19-22 here, said booth sales are running about 12% ahead of last year and registration will be up about 20%.

The organization said there would be around 800 booths this year, way off the 1,000 booths of a few years past, but ahead of the 540 last year. Attendance is pegged at approximately 30,000, up from the 25,000 last year.

Supershorts

Sycor, Inc. has cut OEM prices by as much as 33% on its Model 125 digital cassette recorder. As a result, the 1,000 char./sec recorder now costs $600, in quantities of 25 or more.

– – –

Ampex Corp. has delivered its 2,500th Model TMZ digital tape drive for computers.

– – –

Price reductions of 7% to 13% on solid-state keyboards scheduled for delivery after Jan. 1, 1973, have been announced by Honeywell's Micro Switch Division.

– – –

Centronics Data Computer Corp. said shipments will begin in July 1972 for its Model 102B printer.

– – –

Pertec Corp. has reached a final agreement with the Singer Co., Business Machines Division, covering sales of Pertec key-to-tape data entry systems to Singer over the next 30 months. As previously announced, the terms of the new agreement cover Singer purchasing approximately $15 million of Pertec key-to-tape systems. Of this total, $6 million is firmly committed during the first 12-month period ending April 30, 1973.

– – –

Tab Products Co. said initial shipments of its electronic card punch-verifier have been made to customers in the U.S. and Canada.

– – –

Autocomp, Inc. has been selected to computerize, electronically photocompose and publish the "Investment Legislation of Nations" for the World Bank.

Memory Firms React

IBM Move 'Against Spirit' of Ruling

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Independent memory makers are still confused over IBM World Trade's announcement that it would not continue to maintain 360/30s with extended memory overseas (CW, May 24), but they plan some actions to alleviate the situation.

The major action apparently open to the independents is to complete already started design work on an interface to make the memories transparent to the IBM systems.

"We think that this type of interface will permit IBM to maintain extended 30s in foreign countries," according to Roger Goetz, marketing vice-president at Computer Investors Group, which markets the Data Recall memories.

Back in Top Slot

"After we received IBM's assurance that they would maintain extended 30s on a best-efforts basis in the U.S., we gave a lower priority rating to this development work," he admitted, but added "that development is now back in a top priority position."

IBM has indicated it would maintain systems extended to 96K or 128K with the use of independent memory if that memory was completely transparent and if all of the electronics for such a system were contained outside the IBM mainframe, he indicated.

Several other memory manufacturers said they felt the IBM move "was against the spirit, if not the letter," of the decision they accepted in the stipulated judgment in the U.S. case involving extended memories.

"I think," another said, "that IBM is trying to scare overseas customers, especially European customers, away from independent peripherals completely.

"The Europeans are more dependent on IBM than are their American counterparts," he added, "and a move like this could not only scare them away from extended 30s, but also from other extended systems, even though they are approved for maintenance.

"The move," he added, "might be enough to scare them away from using independent tape and disk also, especially if salesmen in the field hint that other maintenance withdrawals are possible."

"In effect, the IBM action," another said, "could close us out of the European market completely, especially if it has the effect of scaring off users there – and that market was just about to open up."

Computer Investors Group has already represented the IBM maintenance withdrawal to IBM officials, Goetz said, "but we don't know what further action we can take besides developing an interface that they will find acceptable."

The only other action open, most of the memory makers agreed, would be to take IBM to court in the various countries overseas.

"But," according to one, "that would be extremely expensive and the European courts are not as favorable toward anti-trust complaints as are the U.S. courts. We could end up spending a lot of money, without much chance of success at all."

Leasing Activity Upswing Seen With Purchases of $200 Million

NEWTON, Mass. – Activity in the leasing industry is expected to pick up somewhat this year, with the firms in the industry buying around $200 million worth of IBM 360s and 370s, according to International Data Corp.

The purchases are well below the $1 billion in purchases registered yearly in the late 1960s, but are up 100% from the $100 million in computer purchases made in recessionary 1971.

The top twelve" of the industry today have inventories valued at around $1.9 billion, the research firm said, for about 75% of the market for computers leased on an operating basis.

Total Equipment Value

The total value of equipment leased on an operating basis is around $2.5 billion, the firm said, and there is about $440 million in equipment owned by leasing firms and offered on a full payout basis.

DPF has the largest inventory of equipment, with machines valued at $232 million or 9.2% of the machines on lease. DPF is followed by Boothe Computer Corp. with a $215 million inventory; Itel with $210 million; Greyhound Computer Corp. with $190 million; and Diebold with $178 million.

Others of the "big twelve" include Randolph ($175 million); Leasco ($160 million); Rockwood ($158 million); Computer Leasing ($108 million, not including full payout); Granite ($100 million); Dearborn ($80 million); and National Computer Rental ($90 million).

The introduction of the 370 has had a tremendous impact on 360 prices offered by the leasing firms. In total, the average price of a 360 system has dropped to 47% of the original IBM rent for the systems, IDC said.

There have been particularly sharp drops in the lease rates for 50s and 65s, the firm said, since deliveries started on the 370/155 and 165. Sharp drops are expected in the lease rates for 30s and 40s as deliveries of the 135 and 145 accelerate, the firm added.

Fujitsu Chief Sees Japan Overtaking U.S. In DP, IBM Falling

SYDNEY, Australia – Japan's computer technology is rapidly overhauling the U.S. and it is only a matter of time before IBM loses its leading position in the Japanese market, according to Kadoru Ando, managing director of Fujitsu.

Ando, at the Australian Computer Conference in Brisbane, said until now computer makers have concentrated too much on hardware – what they really should be selling is systems.

IBM now has to hold as much as 60% of the Japanese market, but has been whittled down to 23%, he said. Fujitsu's share has risen to 18% to 19% and the company is now starting to look overseas.

"Computers will become the key industry in Japan. They will have to be. Our only resources are human resources which means we have to specialize in knowledge-intensive industry," Ando said.

"Today we have primary, secondary and tertiary industries. In the future we will have a fourth branch of industry – the knowledge-intensive industries based on the application of computers."

Ross Controls Cassette Drive Designed With 2 Moving Parts

By Frank Piasta
Of the CW Staff

NEWTON, Mass. – Ross Controls Corp. has developed a magnetic tape cassette drive with only two moving parts for digital applications.

Designed specifically for recording data rather than as a converted audio unit, the Ross 1000 tape deck eliminates capstans and pinch rollers. It relies on a system consisting of two dc reel motors and an analog servo to control the tape speed and motion.

Most cassette drives, the company said, are designed on the same principles that govern the design of audio cassettes where tape speed variations create unacceptable audio distortions.

For digital recording applications, where the tape is fully magnetized in one polarity or the other, moderate variations in tape velocity, including flutter, don't have much effect on the data, the company claimed.

The 1000 deck is also said to eliminate problems specifically connected with capstans, i.e. they imbed dust and oxide particles into tape, cause sharp tape curvature that separates oxides from the tape, result in stop/start snatching that can stretch or break tape, depend on friction drive that can slip in oily atmosphere and require solenoid-operated mechanisms.

Ross Series 1000 Drive

Another advantage of the simplified design, the company pointed out, is that the method of construction allows components to be firmly attached in place, resulting in compatibility among Ross Model 1000 drives.

In addition to the basic Model 1000 deck, the drive is available in both parallel I/O and serial I/O versions. The deck can also be ordered in versions that include the servo and control electronics, chassis and enclosure and power supply. The deck only is priced at $225; servo and electronics, $225; I/O interface, $104; and power supply, $125, in unit quantity.

The cassette decks are available in evaluation quantities within two weeks from 381 Elliot St., 02164.

Upswing Seen in 1973

Japanese Computer Makers Expect Flat Year in '72

Dempa Publications, Japan

TOKYO – The sales records of six Japanese computer and related equipment manufacturers (Fujitsu, Nippon Electric, Hitachi, Toshiba, Oki Electric, Mitsubishi Electric), for the latter half of 1971 indicate that the firms' computer operations showed only slight gains over the first half of the year.

The combined sales total of the computer divisions of the six manufacturers totaled approximately $519.5 million during the second half of 1970, $389.6 million in the first half of 1971 and $487 million in the second half of 1971.

In their 1972 sales projections, the makers do not expect any great increases, but instead predict they will maintain steady sales and project an upswing in 1973.

Fujitsu sales in the second half of 1971 were $287 million, and profits came to $15.6 million.

These figures reflect increases in both sales and profits over the first half of 1971; they also reflect an increase in sales but a decrease in profits in comparison with the same 1970 period.

DP Importance

Data processing equipment sales registered $176.9 million, 61.6% of the total sales. Since the sales shares of other categories did not exceed 10%, it can be seen that DP equipment is the profit mainstay.

Sales in this category increased, in spite of the economic slowdown, 36.5% over the preceding six-month period and 7.8% over the corresponding period of 1970. Included in DP equipment are numeric control (NC) equipment, computers and data communications equipment.

Sales in the first half of 1971 (excluding NC) totaled approximately $119.5 million, and data equipment sales for the entire year totaled $288.3 million, which placed Fujitsu in the top position among the six domestic computer manufacturers.

The increased sales of data equipment are attributable to Facom 230-60 deliveries, which account for 35% to 36% of total sales.

Hitachi's report for the second half of 1971 showed total sales of $1.3 billion (a 30% decrease from the previous six-month period) and profits of $33.8 million (2% decrease).

Computers and related equipment are broken down into communications equipment, electronic equipment and measuring equipment. The total sales of this group were $261 million, a 20.2% share of the overall total. The growth rate over the previous six-month period remained steady at 1.3%.

Computer and related equipment deliveries accounted for approximately 40% of the total in this group, amounting to about $103.9 million. Since deliveries for the first six months of 1971 totaled slightly less, $97.4 million, the total 1971 deliveries amounted to $194.8 million to $201.3 million.

Nippon Electric Growth

The figures from Nippon Electric for the second half of 1971 showed sales of $392.9 million and profits of $13.3 million, increases of 2.1% and 6.4%, respectively, in comparison with the first half of the year.

Computers and related equipment are included in the electronic equipment category. Sales of this category totaled $196.5 million, 27% of the total sales, the highest percentage among the major product categories.

The sales share of computers and related equipment was approximately $90.9 million.

Including data communications and related equipment, computer sales were listed as approximately $194.8 million for 1971.

Toshiba reported sales of $974 million and profits of $13.3 million in the second half of 1971; a decrease in both categories as compared to the first half of the year.

Computers and related equipment are included in the communications electronics department, which had a 21% share of the overall sales.

Computers and related equipment sales were reported to be $74.7 million for all of 1971, with the breakdown given as $29.2 million for the first half and approximately $45.5 million for the second half of the year.

Oki Electric's figures for the second half of 1971 showed sales of $139.9 million and profits of $3.6 million. This reflects a 2% increase in sales and 12% decrease in profits compared with the first half of the year.

Computers and related equipment were included under electronic business machines, and sales for the second half of the year were $51.6 million, 37% of the total sales and a 10% increase over sales during the first half of the year.

Mitsubishi Electric's sales for the latter half of 1971 reached a total of $690.9 million, and profits totaled $10.4 million. Sales of the electronic-industrial equipment division totaled $208.8 million, 29.4% of the total.

The company reported that the $39 million figure for sales of computers and related equipment during 1971 was divided almost equally between the first and second halves of the year.

Datran Plans Construction Start in Houston This Year

HOUSTON – Construction of the Data Transmission Co. (Datran) national data communications network will begin here this year, Glenn E. Penisten, Datran's president and chief executive officer, told the annual meeting of University Computing (UCC) recently. UCC is Datran's parent company.

Datran has completed plans for early offering of data communications services by 1974, Penisten told the group. Initially, he stated Datran plans to interconnect with existing telecommunications intra-city facilities.

The company, however, intends to introduce elements of its own solidstate switching and intra-city distribution facilities into the system in the mid-1970s as previously planned.

"An attractive feature of this implementation plan is the reduction of the prior requirements of $300 million initial financing to below $200 million," Penisten said. "Consequently, UCC's early investment in Datran becomes proportionately more significant and permits optimizing UCC shareholder's position in Datran."

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NASHUA

Grosch Charges

IBM Competition Will Falter by 1980

Special to Computerworld

SEATTLE, Wash. – There will be one supplier of computing equipment by 1980 – IBM, Dr. Herbert Grosch said at a recent ACM chapter meeting here.

The U.S. Department of Justice, he said, is simply outgunned, with "only three lawyers" opposing a "$200 million per year" IBM legal staff. Antitrust action is not an effective counter force, he claimed.

He analyzed IBM's competition:

- XDS is "essentially dead already."
- NCR is "smiling but fading," and "will not invest in new generational development."
- Burroughs is "touchy," a potential survivor unless they have troubles with one of their large English bank customers, which he thinks they will.
- Honeywell and Univac both have "half of their corporate expense in computing," a danger point in corporate balance.
- CDC is quite dependent on war/space decisions.

But none will last until 1980. "The weaklings," he said, "will drop out in the next 2-3 years."

Expanding his viewpoint, he also analyzed foreign vendors.

The Fujitsu/Hitachi combine in Japan, he felt, will be "the most lasting competitor of IBM worldwide." All Japanese computing, both manufacturing and using, is "growing at a fantastic rate."

Western European computing is "gaining ground, but toward oblivion" since they "won't be competitive." Eastern Europe is "losing ground."

By the end of the decade, Grosch said, IBM will be bigger than GM and Bell Telephone are today.

Grosch built a foundation of statistical facts under his predictions:

- The U.S. manufactures 90% of the world's computers – and that figure is rising.
- The U.S. uses 67% of the world's computers – a figure that is dropping.
- The U.S. Government is the second most important force in computing (after IBM), with 2% of the national budget going to data processing.
- Although IBM's percentage of the commercial market is in the high sixties, its percentage of the government market is 24%, and dropping slowly.
- The government is 4% of IBM's market, 15% of Univac's, 30% of CDC's.

Adapso Wants U.S. Agency

WASHINGTON, D.C. – "There is a need to create a government agency to deal with the points of view of the computer services industry," according to Bernard Goldstein, president of the Association of Data Processing Service Organizations, Inc., (Adapso).

Goldstein indicated that Adapso's experiences before two sister agencies, the Federal Reserve Board and the Federal Communications Commission, produced diametrically opposite decisions on essentially the same subject.

The question was how these regulatory agencies were going to maintain free and equal competition in the DP marketplace as two government granted monopoly industries prepared to enter this activity.

The Federal Reserve Board chose to interpret legislation passed in Congress as an expression of expansionism for the designs of the banking industry, while the FCC adopted and recently reaffirmed the doctrine of "maximum separation" from a parent company in a regulated industry.

"This brought to a head," Goldstein concluded, "the evaluation on the part of the computer services industry that an agency, not regulatory in nature, but responsive and consistent to the needs of free enterprise organizations in this industry should be established.

"We simply have no redress to administretive rulings – except the expensive lobbying in the halls of Congress or legal suits," he added.

Orders & Installations

The Federal Communications Commission has ordered a Univac 1106, four Uniscope 100 CRTs and a Univac 9200 for the Spectrum Management Task Force operating in Chicago. The Task Force will use the system to process and analyze data concerning the use of a land mobile radio service.

The Fireman's Fund American Insurance Companies, San Francisco, Calif., and State Farm Mutual Automobile Insurance Co., Bloomington, Ill., have purchased the Tape Management Software system from University Computing Co.

Children's Hospital, Birmingham, Ala., and Catawba Hospital, Hickory, N.C., have ordered Honeywell Model 105 computers. Catawba will use its system for patient accounting, a tax digest system for Catawba County, and payroll applications.

Burlington Northern Railroad has ordered four Comten 3670 communication control modules, which will be interfaced with two 360/65s.

The Southern Railway System has purchased four Ampex extended core memories, two ECM-50s and two ECM-65s.

Northrup Corp. has installed Western Telematic Model CTC punched card terminals for 14 teleprocessing stations which are linked to a 370/165.

Delta Air Lines has installed more than 700 Collins Radio Co. modems in its Deltamatic Reservation System.

Owens-Corning Fiberglass has ordered a Comten 45 communications system, which will perform message switching for its data center in Cleveland. Computer Network Corp. has leased a Comten 3670 communication control module which will be used in conjunction with a Comten 40 communications front-end to expand the capabilities of Comten's time-sharing services.

The St. Paul Insurance Companies have installed MRI Systems Corp.'s data base management System 2000.

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$30 Million Cost Seen

Amex Plans for Central Exchange

NEW YORK – A plan to place computer terminals in all stock exchanges at a cost of $30 million over the next 18 months is being pushed by the American Stock Exchange.

Paul Kolton, Amex president, said a national central market system would have to be geared to handle trading volume of 50 to 100 million shares per day with EDP capability to file electronically one million public orders and handle 750,000 messages daily.

Kolton's estimates are based on Amex planning of a major computer system capable of handling the requirements of a central market linking all exchanges in a giant service network for investors.

Addressing the Financial Analysts Federation recently Kolton said, "We are closer to a new industry than most people realize."

Technology Available

He stated the technology for a national system is available today. "The terminals could be placed in participating exchanges in only 18 months, and the system can be built at a cost of about $30 million – a great deal of money, but a modest expenditure for the securities industry," he said.

"This is so much more than a long-range plan," he explained. "It has been developed by the Amex over the past several years to meet our own needs – and it works. Called Amcode (American Stock Exchange Computerized Order Display and Execution System), it can be expanded into a national exchange system."

Amex plans to turn over Amcode to Securities Industry Automation Corp. (SIAC) "for adapting any or all of its features to a national system of exchanges. At the same time, we suggest that SIAC consider adding to its organization representatives from the regional exchanges that will give it a truly national character," he said.

"But since SIAC is an operational entity – in effect a service bureau for the industry – it also will be necessary to provide for a policy-making body for the national system.

Amcode is "an integrated system that captures, stores, displays and retrieves orders transmitted directly from a member firm to the exchange floor or to the specialist's electronic book," he said.

"Key parts of the Amcode system are on-line today, and our plan calls for it to be fully operational at the Amex in three years. For a national market the Amcode prototype would have to be expanded so that its computers can handle, at the outset, an average of 50 million shares a day, with peak volumes of 100 million shares."

Nickels & Dimes

Interdata estimates an annual growth of 23% for the small digital computer industry. From a $300 million base in '72, the industry will surpass $550 million in 1975. Of the total industry, the data communications sector should grow at a 38% annual rate, and industrial control segment at 22%, according to the firm.

$$$

Evidently there were some women's libbers at the **Burroughs** stockholders meeting. Twenty-eight percent of Burroughs' total employees are women: 5% in the professional group, 83% in the office and clerical aree, and 51% in manufacturing operations, the firm said.

$$$

Testing the Water? "Memorex's entry into the systems business . . . does not involve more than incremental investment and incremental operating expense budgets . . . Memorex has minimized the risk of limited customer acceptance by undertaking a limited manufacturing build-up," the firm stated.

$$$

Shereholders of **Ocean Data Equipment Corp.** have approved a two-for-one stock split and agreed to change the corporate name to Odec, Inc.

$$$

Keydata Corp. has raised approximately $1.5 million through the private placement of 200,000 shares of common stock and 100,000 warrants to purchase shares of common stock at $10 per share.

$$$

Tymshare attributed its reduced first-quarter earnings on a 24% rise in revenues to higher costs resulting from the addition of three computers. Earnings for the period ended March 31 totaled $110,438, down from last yeer's $123,192.

These securities have not been and are not being offered to the public. This announcement appears as a matter of record only.

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TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE&QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, JUNE 1, 1972

E X C H		1972 RANGE (1)	CLOSE JUNE 1 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/4	0	0.0
A	APPLIED DATA RES.	5- 7	5 7/8	- 3/8	-7.5
O	APPLIED LOGIC	1- 4	2 7/8	+ 1/4	+9.5
N	AUTOMATIC DATA PROC	72- 91	87 1/4	- 3/4	-0.4
O	AUTO SCIENCES	1- 1	1/8	- 1/8	-50.0
O	COMPUTER DIMENSIONS	8- 14	10 5/8	+1	+10.2
O	COMPUTER NETWORK	4- 7	5 3/4	- 1/4	-4.1
N	COMPUTER SCIENCES	7- 10	7 5/8	+ 1/4	+3.3
O	COMPUTER TECHNOLOGY	6- 8	6 1/4	+ 1/4	+4.1
O	COMPUTER USAGE	9- 16	12	- 1/2	-4.0
O	COMP AUTOMOT REPORTS	5- 9	6	0	0.0
N	COMPUTING & SOFTWARE	20- 28	20 7/8	- 3/8	-1.7
O	COMRESS	1- 3	1 7/8	0	0.0
O	COMSHARE	5- 10	7 3/4	+ 1/8	+1.6
O	DATA AUTHORITY	1- 1	1/4	0	0.0
O	DATAMATION SERVICE	1- 1	3/4	- 1/8	-14.2
O	DATATAB	5- 9	6	0	0.0
O	EDP RESOURCES	8- 8	8	- 1/2	-10.5
A	ELECT COMP PROD	3- 5	2 7/8	0	0.0
N	ELECTRONIC DATA SYS.	53- 63	61	+1 1/2	+2.5
O	INFORMATICS	8- 11	9	1/4	+2.8
O	I.O.A. DATA CORP	1- 2	2 1/8	0	0.0
A	ITEL	9- 12	9	- 1/4	-2.7
O	KEANE ASSOCIATES	4- 7	4 1/2	- 3/4	-14.2
O	KEYDATA CORP	7- 11	13 1/2	+1 1/4	+10.2
O	LOGICON	4- 9	8 1/8	- 1/8	-1.5
A	MANAGEMENT DATA	6- 10	7 3/4	0	0.0
O	NATIONAL CSS INC	8- 21	21	+1	+5.0
O	NAT COMP ANALYSTS	1- 1	3/4	- 1/4	-14.2
P	ON LINE SYSTEMS INC	8- 16	15 5/8	- 1/4	-1.5
N	PLANNING RESEARCH	11- 17	12 1/2	+ 5/8	+5.2
O	PROGRAMMING METHODS	24- 34	33 1/2	+ 1/8	+0.3
O	PROGRAMMING & SYS	1- 2	1 1/4	- 1/8	-9.0
O	SCIENTIFIC COMPUTERS	4- 6	5 3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 5	4	0	0.0
O	SOFTWARE SYSTEMS	1- 3	1 3/8	0	0.0
O	T&S COMPUTER CENTERS	4- 6	5 7/8	0	0.0
O	TRACOR COMPUTING	2- 3	3 1/4	0	0.0
O	TYMSHARE INC	7- 10	8	- 1/2	-5.8
N	UNITED DATA CENTER	1- 5	2 7/8	0	0.0
N	UNIVERSITY COMPUTING	19- 28	22	- 3/8	-1.6
A	URS SYSTEMS	6- 10	9 1/8	- 5/8	-6.4
O	VORTEK CORP	4- 5	2 1/2	0	0.0

PERIPHERALS & SUBSYSTEMS

N	ADDRESSOGRAPH-MULT	34- 44	42 7/8	-1 3/8	-3.1
O	AUDIONAMIC	1- 2	1 7/8	0	0.0
N	AMPEX CORP	8- 15	7 3/4	+ 1/4	+3.3
O	ANDERSON JACOBSON	3- 8	3 1/2	+ 1/4	+7.6
O	ATLANTIC TECHNOLOGY	3- 11	7 1/4	+ 1/4	+3.5
A	BOLT,BERANEK & NEW	5- 10	14 5/8	+ 1/8	+0.8
N	BUNKER-RAMO	14- 19	12 1/4	- 1/4	-2.0
A	CALCOMP	17- 25	17 5/8	- 5/8	-3.4
O	CENTRONICS DATA COMP	11- 43	44 +2		+4.7
O	CONNTRONICS	3- 5	3 5/8	- 1/8	-3.3
O	COMPUTER COMMUN.	3- 7	3	- 7/8	-22.5
A	COMPUTER EQUIPMENT	3- 4	3 1/4	- 1/4	-6.8
O	COMPUTER MACHINERY	7- 13	10 7/8	- 1/8	-1.1
A	COMPUTEST	5- 9	5 5/8	0	0.0
O	CONSOL COMPUTER LTD.	1- 1	5/8	0	0.0
A	DATA PRODUCTS CORP	5- 7	5 5/8	+ 5/8	+7.5
O	DATA RECONDITION	3- 5	3 1/2	0	0.0
O	DATA TECHNOLOGY	3- 5	3 1/4	+ 1/4	+8.3
O	DIJAM CONTROLS	0- 8	6 5/8	+ 5/8	+10.8
O	DIGITRONICS	2- 4	4	0	0.0
N	ELECTRONIC M & M	5- 8	5 1/8	0	0.0
O	FABRI-TEK	2- 5	3 1/2	- 1/8	-3.4
O	GENERAL COMPUTER SYS	7- 16	13 1/2	-1 1/4	-8.4
N	GENERAL ELECTRIC	69- 79	73 1/4	- 1/2	-0.6
N	HAZELTINE CORP	9- 13	11 1/2	- 3/8	-3.1
N	INFOREX INC	28- 47	41	+ 1/4	+1.9
O	INFORMATION DISPLAYS	3- 5	2 1/2	- 1/8	-4.7
O	MANAGEMENT ASSIST	1- 2	3/4	0	0.0
N	MEMOREX	27- 38	31 5/8	- 1/4	-0.7
A	MILGO ELECTRONICS	17- 44	41 5/8	+ 1/8	+0.2
N	MOHAWK DATA SCI	20- 27	24 1/4	- 1/2	-2.0
O	OPTICAL SCANNING	7- 16	9 1/4	+ 1/4	+2.9
N	PERTEC CORP	11- 17	10 1/2	-1 1/4	-10.6
O	PHOTON	7- 15	13 1/2	- 5/8	-4.4
A	POTTER INSTRUMENT	15- 21	14 5/8	- 1/2	-3.3
O	PRECISION INST.	7- 13	10	-1 1/4	-11.1
O	RECOGNITION EQUIP	8- 15	9 3/8	+ 1/8	+1.3
N	SANDERS ASSOCIATES	15- 21	15 7/8	+ 1/8	+0.5
O	SCAN DATA	9- 13	9 5/8	- 5/8	-6.0
O	STORAGE TECHNOLOGY	17- 36	33 1/8	+ 1/8	+11.4
O	SYCOR INC	7- 10	10 1/2	+ 1/2	+5.0
O	TALLY CORP.	8- 13	13 1/2	+2 1/8	+22.6
N	TEKTRONIX INC	34- 57	56	+2 5/8	+4.9
N	TELEX	8- 15	10 3/8	+ 7/8	+9.2

SUPPLIES & ACCESSORIES

O	GALTIMORE BUS FORMS	6- 9	7 1/4	0	0.0
A	GARRY WRIGHT	9- 13	13 1/2	- 1/8	+1.0
A	DATA DOCUMENTS	17- 26	23 7/8	- 3/8	-1.6
O	OUPLEX PRODUCTS INC	9- 16	9 1/4	- 1/4	-2.6
N	ENNIS BUS. FORMS	7- 10	9 1/2	- 5/8	+7.0
O	GRAHAM MAGNETICS	15- 27	20 1/8	- 1/8	-0.6
O	GRAPHIC CONTROLS	12- 15	14 1/4	1/2	-3.3
N	3M COMPANY	129-158	153 1/4	-3 3/4	-2.3
O	MOORE BUS. FORMS	42- 55	54	- 5/8	-1.1
N	NASHUA CORP	48- 56	55 1/8	+ 1/8	+0.2

E X C H		1972 RANGE (1)	CLOSE JUNE 1 1972	WEEK NET CHNGE	WEEK PCT CHNGE
N	REYNOLDS & REYNOLD	37- 77	41 1/2	+ 1/2	+1.2
O	STANDARD REGISTER	16- 20	17 1/4	+ 1/4	+1.4
O	TAB PRODUCTS CO	14- 17	15 1/4	+ 3/4	+4.8
N	VARCO	23- 28	25 5/8	+ 1/8	+0.5
A	WABASH MAGNETICS	8- 11	9 3/4	- 1/2	-4.8
N	WALLACE BUS FORMS	23- 26	24 +2 1/2		+11.6

COMPUTER SYSTEMS

N	BURROUGHS CORP	147- 189	186 3/8	- 2 5/8	-1.3
N	COLLINS RADIO	14- 20	17	- 1/4	-3.4
N	CONTROL DATA CORP	43- 74	73 5/8	+7 1/4	+10.9
O	DATA GENERAL CORP	56- 99	93	-5 1/2	-5.5
O	DIGITAL COMP CONTROL	10- 25	9 1/2	-1 1/2	-13.6
N	DIGITAL EQUIPMENT	72- 97	89 5/8	- 5/8	-0.4
N	ELECTRONIC ASSOC.	6- 13	12	+1 1/2	+14.2
A	ELECTRONIC ENGINEER.	8- 14	9 5/8	0	0.0
N	FOXBORO	34- 41	39	+2 1/8	+5.1
O	GENERAL AUTOMATION	15- 28	22 1/4	-1 1/2	-6.3
A	HEWLETT-PACKARD CO	46- 69	69	+2 5/8	+3.9
N	HONEYWELL INC	150-158	154 1/8	+ 3/4	+0.4
N	IBM	333-404	398	+5	+1.2
O	INTEGRATA INC	8- 16	10 5/8	+ 7/8	+8.9
O	MICRODATA CORP	5- 10	8	- 1/4	-3.0
N	NCR	29- 55	53 1/2	-1 7/8	-5.3
N	RAYTHEON CO	39- 47	38 5/8	- 5/8	-1.5
N	SPERRY RAND	30- 43	40	- 5/8	-1.5
A	SYSTEMS ENG. LABS	11- 16	13 3/4	- 3/8	-2.8
N	VARIAN ASSOCIATES	14- 18	16	- 1/8	-0.7
N	VICTOR COMPTOMETER	15- 24	21 1/2	+ 1/2	+2.3
N	WANG LABS	35- 60	57 1/8	- 2 1/8	-3.5
N	XEROX CORP	121-159	154 1/2	- 4 1/4	-2.6

LEASING COMPANIES

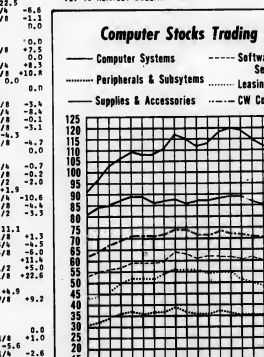
A	GOOTHE COMPUTER	8- 18	8 5/8	- 5/8	-6.7
O	BRESNAHAN COMP.	2- 5	2 5/8	0	0.0
O	CONDISCO INC	5- 11	10	- 1/2	-4.7
O	COMPUTER EXCHANGE	2- 3	2 5/8	- 1/8	-4.5
A	COMPUTER INVSTRS GRP	4- 14	13 3/4	+ 1/4	+2.2
N	DPF INC	6- 13	7 3/8	+1 1/2	+25.5
N	DATRONIC RENTAL	3- 5	2 3/4	- 1/4	-8.3
A	DCL INC	6- 10	6 1/4	+ 1/8	+2.0
A	DEARBORN-STORM	18- 26	22 1/2	- 1/2	-2.1
A	DPA, INC.	5- 8	6 3/8	- 1/4	-3.7
A	GRANITE MGT	7- 11	8 1/4	+ 1/4	+3.1
A	GREYHOUND COMPUTER	8- 13	7 5/8	- 1/8	-1.5
A	LEASCO CORP	19- 24	20 -1 1/8		-5.3
O	LECTRO MGT INC	2- 4	2	0	0.0
O	NCC INDUSTRIES	8- 11	8 3/8	- 1/4	-2.8
A	ROCKWOOD COMPUTER	4- 7	3 7/8	+ 1/8	+3.3
O	SYSTMS CAPITAL	3- 11	4 1/4	-2.6	
N	U.S. LEASING	36- 48	47 1/4	+ 1/4	+0.5

EXCH: H=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

Computer Systems — Software & EDP Services
Peripherals & Subsytems — Leasing Companies
Supplies & Accessories — CW Composite Index



Earnings Reports

CENTRONICS DATA COMPUTER
Nine Months Ended March 31

	1972	1971
Shr Ernd	$.37	$(.23)
Revenue	3,995,227	162,817
Earnings	881,163	(518,535)

BRADFORD COMPUTER & SYSTEMS
Three Months Ended March 31

	1972	a1971
Shr Ernd	$.15	$.07
Revenue	4,887,680	3,392,044
spec item	c116,820	d171,472
Earnings	503,516	223,632

a-restated to reflect acquisitions on a pooling-of-interests basis. c-Tax loss carryforward credit. d-Debit; company's equity in subsidiary's non-recurring start-up costs.

DIJAM CONTROLS
Three Months Ended March 31

	1972	1971
Shr Ernd	$.19	$.01
Revenue	566,542	399,931
Earnings	167,516	10,480

DIEBOLD
Three Months Ended March 31

	1972	1971
Shr Ernd	$.36	$.24
Revenue	37,134,076	31,176,286
Earnings	1,373,683	1,164,489

NATIONAL INFORMATION SYSTEMS
Three Months Ended March 31

	1972	1971
Shr Ernd	$.02	$.01
Revenue	2,039,947	1,373,683
Earnings	91,578	58,443

p-Includes Computer Investments & Leasing Corp. acquired on Dec. 31, 1971, on a pooling-of-interests basis.

COMPUTER MACHINERY
Three Months Ended March 31

	1972	1971
Revenue	$3,180,000	$2,204,956
Loss	1,277,000	659,000

APPLIED DATA RESEARCH
Three Months Ended March 31

	1972	1971
Shr Ernd	$.01	$.07
aRevenue	2,107,589	$1,574,168
Loss Disc Op	.....	17,655
Earnings	13,590	(145,206)

a-From continuing operations.

STORAGE TECHNOLOGY
Three Months Ended March 31

	1972	1971
Shr Ernd	$.07	$.07
Revenue	3,731,708	449,727
Earnings	207,000	(1,668,739)

DIGITAL EQUIPMENT
Three Months Ended April 1

	1972	1971
Shr Ernd	$.36	$.23
Revenue	47,732,000	35,813,000
Earnings	3,652,000	2,342,000
9 Mo Shr	1.00	.78
Revenue	131,085,000	104,330,000
Earnings	10,240,000	7,748,000

COGNITRONICS
Year Ended Dec. 31

	1971	1970
Revenue	$2,958,754	$3,017,226
Spec Chg	150,000	684,644
Loss	1,051,660	1,395,177

a-Consists of a provision for loss on sale of subsidiary in 1971 of $1,100,000 less gain of $950,000 from sale of investment. b-Writeoff of deferred research, development, programming, patent costs.

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